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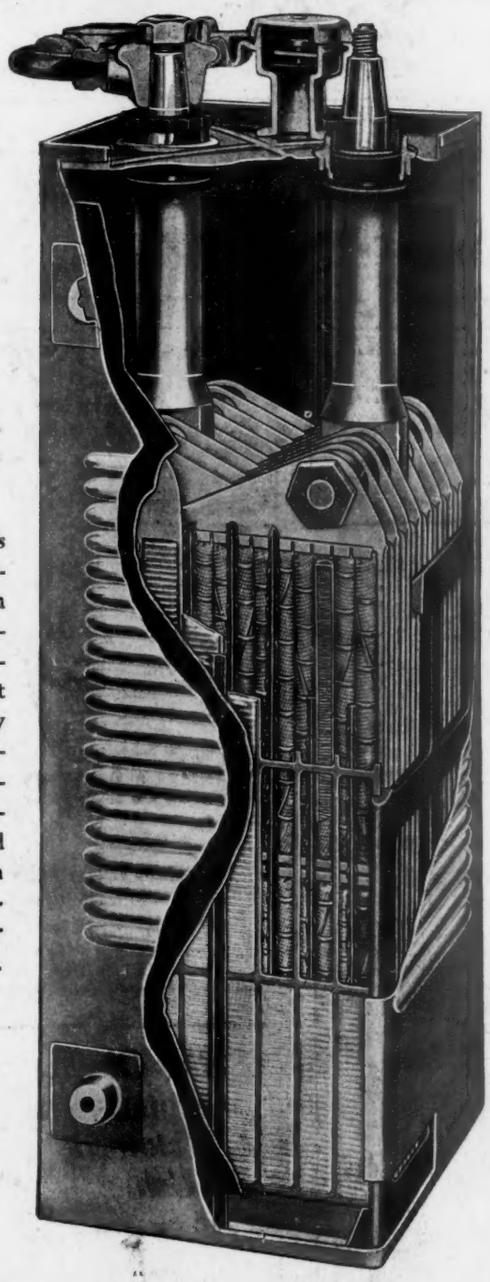

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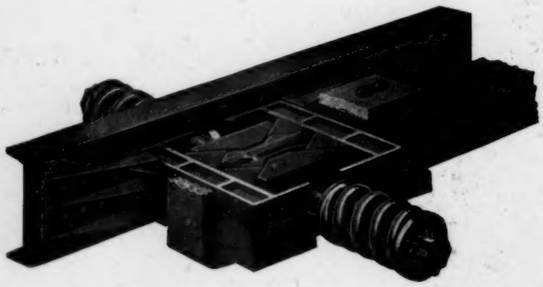

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Railway Age Gazette

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Mechanical Engineering Efficiency

The letter on another page signed by A Draftsman was not inspired by the article on Mechanical Department Engineering, by C. A. Seley, which was published in the *Railway Age Gazette* of March 30, page 691; it was in our hands before the receipt of Mr. Seley's article. While it approaches the problem of mechanical designing and drawing room efficiency in a very different way from Mr. Seley, it indicates in no uncertain manner the need of real executive ability on the part of the mechanical engineer. Of what real service can the mechanical engineering department be if it lags behind the rest of the organization when it should be the leader? True, on many roads it has been considered a necessary evil and has been given little more in the way of support than was absolutely necessary to keep it ahead of the emergency work; and yet is not the mechanical engineer to blame for this condition? Who else is in a better position to study and realize the possibilities of this department and stir the management up to give it proper support? An attempt to educate the management might indeed awaken some of our mechanical engineers to a greater appreciation of their responsibilities and thus prove of mutual benefit. Few roads have furnished their mechanical engineer's offices either with a sufficient staff of properly trained assistants or with such office and other facilities as to enable them carefully to analyze conditions, present and prospective, and plan accordingly. And yet what other field offers greater returns for a comparatively small expenditure?

Engineers as General Managers

The fact that the new general managers of the Pennsylvania Railroad and the Baltimore & Ohio, both of whose appointments were announced last week, are engineers by training and experience, excited no unusual interest, because the selection of engineers for operating and executive positions on these two roads has been rather the rule than the exception. There are many railroads in this country, however, on which the appointment of a chief engineer to the position of general manager would be a marked innovation. This is unfortunate, not so much because engineers possess qualities which make them peculiarly adapted for the important railway operating or executive positions, as because it indicates that most railway managements tacitly take the view that men without engineering training are more fitted for such positions. Strong men are developed in the mechanical, engineering and other departments as well as the transportation; and the strong men in all departments should be considered as in line for promotion to the higher operating and executive positions. The best results cannot be secured so long as advancement to executive positions is closed to men in any department. It is only by affording opportunities for unlimited advancement that the strongest and most ambitious men in all departments of the service can be retained in the service. Such a policy insures a high grade personnel for each department that will make for maximum efficiency and also provides and develops the best possible timber for the positions of general manager, vice president and president.

New York a Way Station

On April 1 the first regular through passenger train was run from Boston, via the Hell Gate bridge and the Pennsylvania tunnels under the East and North rivers, to Washington. Much has been made in the New York daily papers of the fact that New York is now for the first time in its history a way station between New England and the South. This is a picturesque way of looking at the completion of the $100,000,000 New York Connecting Railroad, with its Hell Gate bridge and with its comparatively few miles of track on Lond Island. There is another way of looking at it, however, which ought to receive more than a passing thought. From a purely business point of view, an expenditure by a corporation for additions or betterments can only be justified if a fair interest return will be earned on the cost. There is another justification for expenditures either by individuals or by corporations, and that is, that such expenditure is an act of good citizenship, which, while it will not earn a fair money return on its cost, will be a contribution toward the common welfare and toward progress. It would appear that the justification for the expenditure by

the Pennsylvania on the New York Connecting must come under the second heading. It is certain that the net earnings from passenger business over the Hell Gate bridge will never pay but a fraction of the interest charges on its cost. The Pennsylvania, it is true, builds for 50 years in the future. Freight business from the South to New England has increased immensely in the last few years and the Hell Gate bridge will make a considerable saving in the handling of this business from New Jersey around New York; but the freight rates on this business are not high. Although the ferry haul is very much shortened for freight there will still be the additional expense of ferriage. There would have to be an enormous increase in the volume of freight exchanged between the New York, New Haven & Hartford and the Pennsylvania at New York city to make the difference in cost between the method of interchange used heretofore and the interchange via the Hell Gate bridge to yield anything approaching a fair return on an investment of $100,000,000, and even if such an increase were to take place during the next 50 years, the fact that during this time an inadequate return will be earned on the investment is sufficient reason for saying that the construction of the Hell Gate bridge is not a money paying investment; neither was the Pennsylvania forced into these expenditures by the pressure of public opinion. The undertaking is an example of good and useful citizenship on the part of one of the greatest of American railroad corporations.

WHAT IS HAPPENING TO RAILWAY EXPENSES

THE public, and especially the shipping public, is manifesting surprise at the application of the railways for a 15 per cent increase in freight rates. Such an increase, it is pointed out, would amount to over $300,000,000 a year. The railways in the last fiscal year had the largest gross and net earnings in their history. Why, it is being asked, while they are still handling a record-breaking business, are they coming in and asking for advances in rates? It is true, shippers are disposed to say, Congress passed and the Supreme Court upheld the Adamson act, giving the train service employees an increase of $60,000,000 a year in wages, but this is not sufficient to justify an advance in rates which in the aggregate would be five times as great as the expense it is estimated will be caused by the Adamson law.

It is perfectly natural that the public, and especially the shipping public, should reason in this way. The reason why it is natural is that the public does not realize, and that railway managers themselves only recently have begun fully to realize, the magnitude of the increases in operating expenses and taxes which the railways suddenly have had thrown upon them. Various figures regarding these increases have been published, but they hardly get into print before they become out of date because of further increases. Practically none of these increases occurred before July, 1915; in fact, prior to that date the reductions in prices were as numerous as the increases. The big increases in prices began in the last half of the calendar year 1915, but they did not get into full swing until the first half of the calendar year 1916. As railways always carry in their storehouses a large amount of materials and supplies which are charged out in succeeding months at the prices which were actually paid for them, and as most equipment ordered late in 1915 and early in 1916 was not delivered until the latter part of 1916, these increases were not seriously felt in operating expenses until within comparatively recent months. Recently, however, they, together with the advances in wages, have begun to be felt to such an extent that in spite of continued increases in gross earnings, reductions in net earnings have begun to be shown. Meantime, taxes have continued to increase, with the result that net operating income has begun rapidly to decline.

The public naturally desires to know what have been some of these increases in expenses and to what extent, if present prices are maintained, they will affect operating expenses. It is impossible as yet to give detailed figures, but it is possible to give some estimates which are based on actual available facts. The following are some estimates as to the extent to which eight items entering into railway expenses will be increased for the railways as a whole annually by advances in wages and prices which already have taken place over wages and prices which actually entered into the operating expenses of the railways during most of the fiscal year ended on June 30, 1916.

Train service employees' wages	$60,000,000
Other employees' wages	40,000,000
Fuel (increase in price, 80 cents a ton)	100,000,000
Taxes (increase, 15 per cent)	22,000,000
Rail (3,000,000 tons, increase in price per ton $10)	30,000,000
Locomotives (3,500, at increase in price of 90 per cent)	72,000,000
Passenger cars (3,000, at increase in price of 50 per cent)	18,000,000
Freight cars (175,000, at increase in price of 50 per cent)	105,000,000
Total increase in these eight items	$447,000,000

Most of these estimates seem conservative. For example, Samuel Rea, president of the Pennsylvania Railroad, has indicated that the eastern roads will have to pay $1 a ton more for coal this year than they did last year, and that if they do the increase in the fuel expense of seven roads will be $37,000,000. On this basis the increase in the fuel expense of the railways of the United States would be considerably greater than $100,000,000. As to the figures regarding increased cost of equipment, they are based, first, upon past experience as to the number of locomotives and cars annually ordered by the railways of the United States, and, second, upon figures as to actual increases in the prices of locomotives and cars which already have occurred.

It is hardly necessary to add that these figures relate to only a small part of the total number of items entering into operating expenses, and that large increases ranging from 25 to 200 per cent have occurred in practically all such items. Therefore, even though some of these rough and approximate figures be too large, it is not improbable that on the basis of present wages, prices and taxes the railroads of the United States are incurring in expenses and taxes exceeding those of the fiscal year 1916 at the rate of $500,000,000 a year. Whether present high prices will be long maintained nobody can say. The only thing certain about them is that at present the railways must pay them. They may not be long maintained; but on the other hand, they may be increased.

What are the shippers and the regulating authorities going to do in the face of such conditions? The demand will doubtless be made that no considerable increases in rates be allowed until after full and prolonged hearings. Well, the railways were not given full and prolonged hearings before Congress voted a $60,000,000 a year increase in the wages of train employees. There have been no suspensions of the increases in the prices they have to pay, pending investigation of their reasonableness. They are the only concerns in the country of which it can be said that they are at present receiving less for what they sell and paying more for what they buy than they ever did before.

In the circumstances it does seem that both on equitable considerations and on sound business principles the determination of the question of advances in rates should be made as soon as practicable. In an industry in which business is done on so narrow a margin of profit as in the railway industry it is quite possible for extreme changes in the volume of business or in operating expenses quickly to turn great seeming prosperity into great adversity. This has occurred in the railway business twice within the last ten years. There is serious danger that unless the rate advance question is handled more expeditiously than it was in 1910-11 and again in 1914-15, the same thing will occur again.

SOME DEFECTS OF RAILWAY ORGANIZATION

THE most wasteful form of economy practiced on a large part of the railways of the United States is that of not providing enough officers. The next most wasteful economy practiced, perhaps, is that of paying a large part of the officers, and especially those in the lower ranks, less than they ought to be paid. If boards of directors and executive officers would give more consideration to how small a part of total earnings and operating expenses the aggregate salaries paid to officers as a whole are, and to how much money can be wasted on railways from want of efficient supervision of the work of employees and of the use of equipment, material and supplies, the economy and efficiency with which our railways are operated would be substantially increased. The wonder is, in view of the way in which most roads are underofficered, that they are operated with the economy and efficiency they are; and it is probable that unless radical changes are made in present methods it will be only a matter of time until efficiency will be seriously undermined.

The railway is a kind of factory, its business being to make transportation. It differs from all other kinds of factories, however, in being only the width of a right of way and anywhere from a few miles to 12,000 miles long. Because of its peculiar characteristics the employees of a railway, instead of being gathered together within a comparatively small space, as is the case with the employees of a factory, are widely scattered. Therefore, the difficulty of supervising the work of a hundred employees on a railway is greater than that of supervising the work of a hundred employees in a factory. In spite of this, however, there is less official supervision of the work of the employees of railways than there is of the work of the employees of factories.

In 1915 the Interstate Commerce Commission changed its method of reporting the number and compensation of the different classes of railway officers and employees. Therefore, it is necessary to use statistics for earlier years to get comparative data regarding these matters. In 1914, the last year for which satisfactory data compiled in the old way are available, the total salaries paid to railway officers were $44,400,000. This amount was only 3.2 per cent of the total compensation paid to all officers and employees, only 2 per cent of total operating expenses, and only 1½ per cent of total earnings. The number of employees to each officer was 111. These statistics show an improvement over those for 1904, when the salaries of officers were 3.1 per cent of the compensation of all officers and employees, 1.8 per cent of operating expenses and 1.3 per cent of earnings and when there were 123 employees to each officer. But the increase in supervision on most roads has been nowhere near enough to secure the greatest practicable efficiency and safety in operation. The fact is, that on most roads the higher officers are working themselves to the limit of human endurance, doing not only things which they ought to be doing, but also a great many things which they ought to be delegating to members of their staffs, if only their staffs were large enough. For example, take the handling of matters growing out of the public relations of the railways. Prior to ten years ago railway managements did not have to trouble themselves much about matters of this kind. Now such matters have become so numerous and important that the higher executive officers, and especially the presidents, are devoting a large part of their time to them. There ought to be created on every large railway system a department of public relations, which should be given general charge of all such matters, and should have a vice-president at its head. Public relations would then be better handled and at the same time the presidents and the heads of the operating, traffic, financial and other existing departments would be relieved of a lot of work and thereby enabled to do better the work which they retained.

Again, a very large part of the vice-presidents in charge of operation are conducting investigations, holding conferences and performing other duties which ought to be delegated to staff specialists. In most cases the main reason why they are not delegated to staff specialists is that there are very few vice-presidents in charge of operation who are provided with as many staff assistants as they ought to have; although in many cases the real trouble is that the vice-presidents persist in performing duties which they could and should assign to others. One of the greatest shortcomings of most of our railway organizations is that they largely ignore the important distinction between a line officer and a staff officer. In consequence, it is very common for line officers to be trying to perform duties which should be performed by staff officers, with the result that the functions of neither line nor staff are satisfactorily performed, or that the officer who tries to perform both kinds of duties breaks down.

One of the most universal of the indefensible practices of our railway managements is that of underpaying officers in the lower ranks. It is not only not uncommon, but is very common, for road foremen of engines, trainmasters, roadmasters, and even master mechanics, division engineers and division superintendents, to be paid less than many employees in train service. The result is that in numerous cases it is found impracticable to get promising men in the train service to accept promotion to official positions because of the reduction in income, accompanied by greater responsibility and lessened security of employment which the change will involve. A point of perhaps even more importance is that an officer who is known to be receiving less compensation than the men whose work he is directing is almost certain to be unable to command the respect, obedience and support from the men that is necessary to getting the best service from them. It is false economy as well as unjust for the management of the railways to continue to pay the officers of the lower ranks relatively so much less, and in many cases absolutely so much less, than some classes of employees. Since the salaries paid to all officers aggregate only 2 per cent of total operating expenses, it is evident that divisional officers and those of lower rank could have their salaries reasonably increased without causing more than a relatively small increase of expenses; and, indeed, it is probable that because of the better class of men and the more efficient service which would be secured in minor official positions the result as a whole would be a reduction rather than an increase of operating expenses.

Every change which occurs in the relations between the railways and the public and the governments, on the one hand, and between them and their employees, on the other hand, makes it more necessary that every railway organization shall be composed of men of the highest type that can be secured and that they shall be given every possible opportunity and inducement to render the best service of which they are capable to the companies. They are not given this opportunity and inducement under a policy which drives important line officers to handle matters which should be handled by subordinate line officers, or by staff officers, and which does not make employment in the lower official ranks attractive to the best men who are available for such employment.

NEW BOOKS

List of Publications Pertaining to Government Ownership of Railways. Published by the Bureau of Railway Economics, Washington, D. C. 100 pages, 6 in. by 9 in., bound in paper.

This is the fourth revised edition of Bulletin No. 62, originally issued by the Bureau of Railway Economies in 1913 as a bibliography of the material on the subject of government ownership. In the preparation of this bibliography every effort has been made to include references to all the available literature on the subject—good, bad and indifferent—for and against government ownership, although no attempt has been made to include references to the larger subject of the relations of railways to the state or to books and articles that are merely descriptive of state railroads. The bibliography is classified by countries and by states in the United States.

Letters to the Editor

DRAWING ROOM MUST PRODUCE RESULTS

MINNESOTA.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The drawing room is a department of some importance in a manufacturing concern; it is looked on with respect, and considered a place where accurate information can be obtained when desired. Why should a railway drawing room not be the same? Not all railway drawing rooms are alike, and some, no doubt, fulfil their mission, but there are more that do not.

Lack of "pep" on the part of someone is too frequently the cause. The mechanical engineer or the chief draftsman may not be of the proper caliber; they may lack energy. If they are deficient in that essential characteristic not much can be expected of their departments. Energy is necessary though one need not be a "slave driver." Most draftsmen are progressive; they wish to accomplish something, to make a good job of each thing assigned to them, and to advance, not only in salary but in their work and in experience. If someone higher up prevents, they cannot give the company the best that is in them. This condition in the drawing room makes it easy to lose the respect of the shops, and once lost, it is restored with difficulty.

The shop and drawing room should be closely related; if they are not results will surely be lacking. Not infrequently it is the drawing room that is to blame. The shop requests prints of information, but it gets them when the drawing room is good and ready. In the meantime the shop has worked out its own salvation and when the prints or information arrive the engine has gone. Drawing rooms are too frequently inclined to take their own time and let the shop wait. Again, when the shop gets the prints desired, more than likely a number of important dimensions are given "to suit," —something a manufacturer will tolerate only rarely—and in unimportant places. But one result can follow:—The breach between shop and drawing room becomes greater until the shop finally concludes the drawing room is a department on which no dependence can be placed.

All this time the men in the drawing room have not done what they could; they have not turned out the work of which they were capable, nor have they hurried themselves. What result can be accomplished by this all too frequent attitude, other than sliding easily along from one day to the next, can hardly be imagined; yet too frequently it is the very attitude that obtains and in some cases with knowledge, if not the consent, of the mechanical engineer. Such conditions not only do not appeal to good draftsmen but cause them to be dissatisfied. Not all draftsmen are "boomers," though it must be admitted some are. To get them to stay is to the advantage of the company as well as the men themselves, and when a man does leave he usually has a reason for doing so.

The management expects the shop to deliver an engine on a certain day and in perfect condition. Why should not the same be expected of the drawing room? Put a drawing room on an efficiency basis and make it produce results. Otherwise a railroad is wasting what it pays to keep the drawing room running. If the results are not forthcoming it is time to start something; results can be obtained.

While it is true a railroad drawing room operates under somewhat less favorable conditions than that of a manufacturing concern, yet this does not excuse it for not getting results. Efficiency should be expected there as well as anywhere else. In making a change don't begin with the office boy, but begin at the other end. The mechanical engineer may be the cause of the trouble; it may be his brakes that are dragging, or possibly the chief draftsman, or even both. Consider the personnel of the department from the top down and weed out the unfit just as is done in the shop or roundhouse. Make "efficiency" the watchword and keep things moving. Let every man know he is constantly on trial, and that an outsider will be taken for the place ahead of him if he is not capable of filling it. When anything is done it should be done thoroughly and gone into from the very bottom. The mechanical engineer, chief draftsman, and the draftsman who did the work should all be held responsible; shiftlessness should be tolerated no more than anywhere else. When the shops request prints, or information, it should be obligatory that it go by return mail, or an explanation why it had not; no more "let them wait" attitudes should be tolerated. Let the men know that the worthy will be promoted when opportunity offers, others will not; no greater mistake can be made than promoting on a strict seniority basis. While it is true seniority should have some weight—capability is worth a hundred times more. With the application of a little of the foregoing many a railroad drawing room could be made a valuable asset to the mechanical department where now it is considered a necessary evil and of very little actual use.

A. DRAFTSMAN.

THE MOUNT UNION COLLISION

OTTUMWA, Iowa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

We must all regret a serious collision which is accompanied by loss of life such as the one at Mount Union, described in the *Railway Age Gazette* of March 9, but if we are ever going to make any progress in transportation in this country we must take advantage of the lessons we learn by experience.

This collision is but another example, of which there have been a number in the past ten years, illustrating what may be expected to happen any time a train stops a short distance beyond an automatic block signal on any railroad where the engineers are taught to disregard a caution signal.

If signals were made to mean "Stop," "Caution," and "Proceed," as the case may be, and nothing else, and engineers were taught to *obey immediately each signal as they came to it,* such accidents as that at Mount Union would be eliminated. As a matter of fact, while we may imagine that signals mean a great variety of other things, when the circumstances are thoroughly analyzed it will be found that all it is possible for them to mean is "Stop," or "Caution," or "Proceed." No signal can mean anything about some signal in advance and if engineers are taught to believe that a caution signal *need not be observed now,* but at some future time in the discretion of the engineers or at some future time or place relative to some other point in advance, a continuation of just such accidents as this may be expected.

Anyone that is interested can find plenty of examples recorded in your publication in the last ten years.

It is said that Engineer Cook, at Mount Union, was of the opinion that the signal was clear, instead of caution; but this only emphasizes the point which I desire to bring out, namely, that if engineers are taught to read and observe each signal as they come to it, and *observe it then and not some later time;* and if they are also taught that these signals mean stop, caution, and proceed, which is all they can ever mean, then they will acquire habit in action which will tend towards safety.

The common rule, that the distant signal need not be observed immediately, *but only at some future point,* and only provided it is necessary, is an invitation to disregard the caution signal, because the engineer finds by experience that many

times the message of the signal ("next signal is at stop"), is not true.

In a perfectly natural way, therefore, the engineman is taught to disregard these caution signals and float past them expecting in the majority of cases to find no necessity for reducing speed; and thus, in a perfectly natural way, is brought about a state of mind that will produce an accident like the one at Mount Union. Whether Cook was or was not as positive as is stated, the fireman's action would have caused him to take immediate steps to bring his train under control if he had been taught to look upon caution signals in their true character and observe them properly. If the brakeman and the fireman had called his attention to the fact that the signal was at caution, and he had been taught to observe caution signals, he would have taken some action, immediately, toward slowing down his train, and thus be on the safe side. His own opinion of the position of this signal would not have permitted him to go ahead, as he did in this particular case, without making any effort to slow up the train.

L. R. CLAUSEN.

TRUCK RESISTANCE ON CURVES

WINNIPEG, Man.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have read with a great deal of interest the letter from Lewis E. Moore, published on page 300 of the issue of February 23, in which he advanced a theory as to why a train would pull harder around a curve with the loaded cars behind the empties. I do not propose to enter into any controversy regarding the original question, as this is a matter that can be decided by the use of a dynamometer car and is not one that it is necessary to prove by theory. The reason that I am writing this letter is to call attention to the lack of knowledge of the construction of railway equipment and the effect it has on curve resistance possessed by so many writers who attempt to explain the different phases of curve resistance. Mr. Moore has evidently overlooked the details of construction of railway car wheels and car trucks and their action on the track or he would not have made the statement he makes when speaking of the effect of centrifugal force, where he says, "Unless, therefore, the speed is great enough to cause the cars to run against the outer rail of the curve." From this statement and from the conclusion drawn by Mr. Moore from his analysis of the problem I take it for granted that he does not know that at least the leading wheel of every truck of a railway car runs against the outer rail of a curve regardless of the elevation of the track or of the speed of trains. If Mr. Moore's theory held good, it would be the inside rail of the curve that would be worn out rapidly and not the outside rail as is the rule in actual practice. The reason why the leading wheel of the truck, at least, runs against the outside rail, is the fact that both wheels are rigidly attached to the axle, and further, that they are both of the same diameter for all practical purposes; the coning and the play between the gage of the wheels and the gage of the track not being sufficient to overcome the difference in the lengths of the inner and outer rails of a curve.

The truck on which a railway car rides, whether it be a four-wheel or a six-wheel truck, is attached to the body of the car in such a way that the latter has no control over the direction in which the trucks will travel; therefore, the only force that can be applied to make the trucks travel in a curve, is the force that the outer rail exerts against the flange of at least the leading wheel of the truck.

MR. MOORE'S THEORY IS AS FOLLOWS:

A partial explanation is as follows: For the sake of simplicity assume a train of two cars of exactly similar construction, one light and the other loaded. Let H be the drawbar pull required to pull the loaded car alone and L be the drawbar pull required to pull the empty car alone. H will be greater than L. In rounding curves the drawbar pull acts at an angle to the tangent to the curve drawn through the center of the car. For simplicity assume that the drawbars are pivoted at the center of the cars. This does not alter the essential principle involved.

In Fig. 1 the loaded car is coupled in front of the empty car. The drawbar pull between the engine and the first car is $H + L$, and that between the first and the second car is L. In this case we will assume the speed so slow that the centrifugal force is practically negligible.

Let the angle between the drawbar and the tangent to the curve at the center of the car be a. The side pressure between the first car and the rail is $(L + H + L)$ *sin a*. The side pressure between the second car and the rail is L *sin a*. The total side pressure is the sum of those two, or $(_2L + H)$ *sin a*, and this quantity multiplied by the coefficient of friction f gives the drag due to the curve with this method of making up the train.

In Fig. 2 the heavy car is coupled behind the light one. Following the same method of analysis the total side pressure is $(_2H + L)$ *sin a*, and this multiplied by the coefficient of friction f gives the drag due to the curve with this method of making up the train.

As H is greater than L, $(_2H + L)$ is obviously greater than $(_3L + H)$, which proves that a train made up as shown in Fig. 1 will haul easier on curves than one made up as shown in Fig. 2. In other words, the side friction will be much greater when the empty cars are at the front of the train and the loaded cars at the rear.

I have reproduced Figs. 1 and 2, but in order to get a concrete case, I have assumed the loads for the empty and loaded car as 20 and 60 tons respectively. We have assumed that the curve is a 6 deg. curve, therefore for an ordinary box car a would equal approximately 1 deg. 15 min., the *sin*

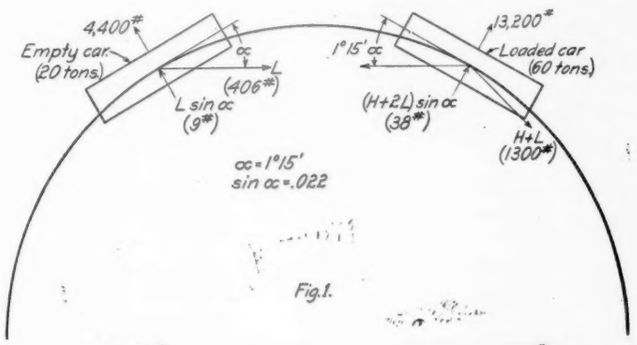


Fig.1.

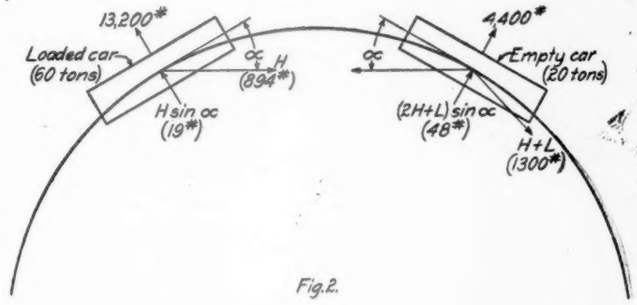


Fig.2.

a would equal 0.022. Assuming that this curve is on a grade such that with the curve resistance the total resistance of curve and grade would be equal to a 0.5 per cent grade on tangent, from the formula of resistance approved by the American Railway Engineering Association

$$R = (g + 2.2)\ T + 162\ C,$$

where R is the resistance in pounds, g is the force of gravity, T the tons and C the number of cars, we get the resistance of a 20-ton car as 406 lb. for speeds between seven and 35 miles an hour and the resistance of a 60-ton car as 894 lb.

Now making a further assumption that only the leading wheel of the truck is wedging against the outside rail and that the only work required to be done to skid that set of wheels transversly to the track is the friction of the load carried by those wheels, we will require a force of 13,200 lb. for a 60-ton car and a force of 4,400 lb. for a 20-ton car. These figures, with the others I have mentioned, I have added in Fig. 1 and 2.

Mr. Moore's mathematics are correct. The inward pull on account of having the loaded car behind is greater than when it is in front, but on account of the greater pressure outwards, one would be led to arrive at an exactly opposite

conclusion to that reached by Mr. Moore. I understand, of course, that this would not be conclusive evidence that Mr. Moore's theory was wrong, for the reason that the inward pressure as the drawbar pull increases, will also increase. Therefore, let us analyze the case of a 60-car train, with 30 loaded cars of 60 tons each or 1,800 tons, and 30 empty cars of 20 tons each or 600 tons, with the grade and curve resistance equal to a 0.5 per cent grade or 10 lb. per ton for g. We will then get for the total resistance or drawbar pull under these conditions,

Loaded cars.... 1,800 tons × 12.2 + 30 × 162 = 26,820 lb. resistance
Empty cars..... 600 tons × 12.2 + 30 × 162 = 12,180 lb. resistance

39,000 lb. resistance

In this case the inward pull on the first car would be 78,000 lb. x 1.022, or 1,716 lb. This inward thrust is a great deal less than one-half the force necessary to skid the leading wheels towards the center of the curve. This force would be reduced by 48 lb. per car for the 30 loaded cars until the inward thrust on the first empty car would be 316 lb. This would reduce gradually until it would be only 9 lb. for the last car. Putting the empties ahead, we would have an inward thrust on the first car of 1,716 lb., this would reduce gradually until coming to the first loaded car, 30 cars back, where the inward force on account of the drawbars would be 1,179 lb. This would reduce gradually until the last car would have an inward force of only 19 lb.

Let us analyze this case a little further. Take an ordinary car, with a gross weight of 40 tons. The extra draw-

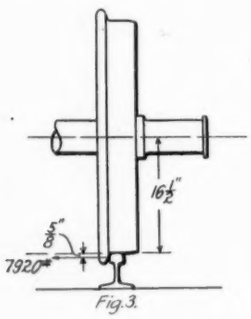


Fig. 3.

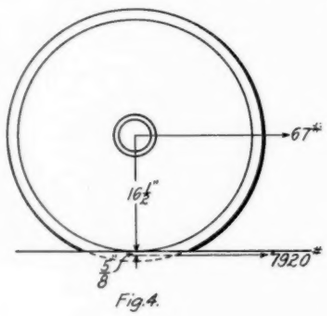


Fig. 4.

bar pull on the engine to haul this car around a 6 deg. curve on a level or an up-grade would be 6 x 0.04 x 20 = 4.8 lb. per ton or 4.8 x 40 = 192 lb. for the car. Assuming as we have before, that only the leading wheels of each truck will run against the outside rail and that the force necessary to skid them transversely to the track is 22 per cent of the load on these leading wheels, then this force equals

$$\frac{80{,}000 \times 22 \text{ per cent}}{2} = 8{,}800 \text{ lb.} \quad \ldots\ldots\ldots\ldots \quad 8{,}800 \text{ lb.}$$

Assuming further that the drawbar pull on each end of the car is 20,000 lb., the inward pull amounts to 40,000 x .002 = ... 880 lb.

Balance to be overcome by the wedge action between wheel and rail ..... 7,920 lb.
Or for each leading wheel..... 3,960 lb.

Let us now analyze what drawbar pull is necessary to overcome this 7,920 lb. side thrust, assuming that this side thrust is applied ⅝ in. below the top of rail as shown in Fig. 3. Then as shown in Fig. 4 a side thrust against the rail ⅝ in. below the top of the rail to turn the wheel without slipping on the tread will necessitate the sliding back a short distance of the point ⅝ in. below the top of the rail. Taking the coefficient of friction as 22 per cent, this will require a force of 22 per cent x 7,920 = 1,742 lb. Now the force applied at the center of the journal with a lever arm of 16½ in. to overcome a force of 1,742 lb. with a lever arm of ⅝ in. $= \frac{1}{26} \times 1{,}742 = 67$ lb., which is not an unreasonable assumption as this leaves the difference between 192 lb. and 67 lb. or 125 lb., to do the work of skidding the inside wheels, the one foot necessary in going every 200 ft. on a 6 deg. curve and overcoming other factors of resistance connected with the resistance offered by curvature.

If we had assumed that the entire load had to be skidded transversely on the rails by the wedge action of the flange against the rail (which assumption, I personally believe is nearer the truth) instead of the assumption that was made of skidding only half the load, then the drawbar force necessary to do this work would have been twice 67 or 134 lb. for a 40-ton car, and the work done in skidding one-half the load a distance of one foot, while a train moved 200 ft. would be 40,000 x co-efficient of friction 22 per cent = 8,800.

$$\frac{8{,}800 \times 1}{200} = 44 \text{ lb.}$$

The total work accounted for would be 134 + 44 = 178 lb., out of what experience and experiments teach us amounts to 192 lb. In other words, it would seem that the greater part of the resistance of curvature is caused by the rigid construction of the car trucks and the rigid wheel and axle construction. That is to say, if we could have loose wheel construction and flexible truck frames, curve resistance would amount to very little and Mr. Moore's theory would be logical.

J. G. SULLIVAN,
Chief Engineer, Western Lines, Canadian Pacific.

BOSTON, Mass.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:—

With reference to Mr. Sullivan's interesting communication I have the following to offer. My original letter assumed a perfectly flexible wheel arrangement, as stated in my answer to Mr. Fowler's letter. (*Railway Age Gazette*, March 23, page 615.) Mr. Sullivan admits in his letter that my statements were correct for the assumptions made. The following remarks concerning Mr. Sullivan's letter may be pertinent. He has reproduced Figs. 1 and 2, but has assumed a concrete case and then added a grade which seems to be an unnecessary complication. His figure does not correctly represent the forces acting because neither of the cars he represents is in equilibrium under the forces shown. This is because of incomplete representation of the forces involved in his analysis. A brief presentation of the subject from a slightly different point of view may be of interest. The first law of motion is that a body tends to continue its state of rest or motion in a straight line unless acted upon by some external force. Considering the car as a whole, it tends to move in a straight line after it is started. When its direction of motion is changed, it is necessary to apply a deviating force at right angles to the direction of motion. This deviating force is called the centripetal force and is the equal and opposite to the "centrifugal force" about which we hear so commonly. This centripetal force is the only force required to deviate the car from a straight line and cause it to follow a curved path. This does not say that, owing to inefficient methods of applying the centripetal force, large resistances may not be set up which appear as additional drawbar pull. It does mean that after all the forces are properly added together their resultant on the body of the car is the necessary deviating force. The inefficiency with which this centripetal force is applied is the predominating cause of the high resistance caused by curves. This inefficiency is caused,

as Mr. Sullivan points out, by the rigid wheel and axle arrangement.

His analysis is an attempt to compute the value of the elements entering into this inefficient method of applying the necessary deviating force in certain assumed cases.

My analysis purposely omitted the inefficiency of application of this deviating force in order to bring out another element entering into the question. It would appear, then, that his analysis bears directly upon the element which I omitted, and is therefore an addition to, rather than a criticism of, my first letter.

LEWIS E. MOORE.

SUGGESTION FOR ATLANTIC CITY EXHIBITORS

CINCINNATI, Ohio.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I have had in mind for some time a suggestion for the use of exhibitors at the M. C. B. convention. During convention week the exhibitors show their latest models and most advanced ideas to hundreds of railroad mechanical officers. Owing to the number of booths which these officers visit during the conventions they cannot remember offhand one-half of the interesting devices they have seen and might make use of when they get home.

They are busy men and cannot be expected to make voluminous notes, neither can you ask them to stuff their pockets with detailed pamphlets. I would suggest that all exhibitors get out a standard (light weight) card, say 3 in. x 5 in., with booth number, firm name, address, and names of representatives at top on one side, followed by an outline of the devices on exhibition similar to that shown on page 1270 of *Daily Railway Age Gazette,* June 14, 1916, but arranged vertically, one item to a line, the reverse side to be left blank for "Memos."

I believe that many a visitor would slip such a card in his pocket and take it home for use in dictating inquiries. Many of those who visit the convention are called on for reports for the use of officials and anything which will help them to make a detailed report will be for the benefit of the exhibitors.

J. T. GROGHEGAN,
Mechanical Engineer, Queen & Crescent.

THE HEN AND THE ERIE FERRY BOAT

165 BROADWAY, NEW YORK.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I am very glad to have my attention called to the letter published in your issue of February 23, 1917, written by Wm. G. Raymond of Chicago, criticizing my article on the function of depreciation in price making, which was first published in the Journal of Accountancy for December, 1916, and reprinted in part in your issue of January 19, 1917.

Mr. Raymond presents four square a claim that, as I see it, must be modified when he says that under public regulation the fair rate for service is not the value of the service to the consumer, but rather is that which will yield to the agency performing the service a fair return on its sacrifice.

In that part of the article that was not published in the *Railway Age Gazette,* I endeavored to present arguments to show the weakness of this contention. If Mr. Raymond will be good enough to give me his address I shall be most happy to send to him a copy of the complete article, which has been published in pamphlet form, and I shall be equally glad to furnish copies to any others who may be interested enough in my opinion on the subject to desire to read it.

Mr. Raymond entirely miscalculates my opinion of the college professors with whom he agrees. None recognizes more clearly than I the debt we owe to these selfsame professors, and even in the case in point I have no quarrel with their theories, but neither they nor I can turn things as they are into things as we should like to have them merely by talking and acting as if the change had already occurred.

The whole purpose of my article was to show that, regardless of the consistency of depreciated property's earning as much as undepreciated property, the fact remains that in all lines of private business this condition exists, and as long as railroads must perform their functions and seek their development in a workaday world rather than in one made to fit our theories, we must not shackle them with artificial impediments that handicap them in their competition for the investor's money upon which their development depends. As I see it, this is the fly in the otherwise perfect ointment.

Even though all of our legislative and administrative bodies make common cause to establish public utility profits at the lowest point that the courts will allow under the constitutional prohibition against confiscation, their efforts are vain indeed—and worse than that, they stand in the way of the development of the country's resources—as long as they drive the investor away from the public utility field, and this result will continue as long as other fields of enterprise offer a higher and surer rate of return for the investor's money.

The only circumstances in which public utilities may be restricted in their earning power to what the public thinks is a fair return on the sacrifice of the agency performing the service is to make that agency the state itself so that the public treasury will be available to provide means for their development. But this solution would entail disadvantages far greater than to accord to the private investor an undepreciated return upon his depreciated property, or more properly speaking, his deteriorated property—as long as his product remains unimpaired.

Mr. Raymond asks who shall say what is the value of service to the consumer. This is one of the prime functions of the federal and state commissions. The Interstate Commerce Commission takes measurement of this feature in practically every decision it renders touching upon the reasonableness of rates. I have yet to learn of any widely held opinion that it does not do its duty well in this respect.

Some years ago employers of labor very generally installed what was known as the piece work system of paying labor. Its effect was to reward the laborer for increased efficiency and the results accomplished were marvelous, so much so that they aroused the cupidity of the employers, who repented of their bargain and took away from their employees the cream of their rewards. As a result a labor problem has developed in this country that threatens to destroy the very foundations of our industrial progress. Laborers have organized into powerful unions, the purpose of which is to demand increased pay and shorter hours and to render a constantly diminishing efficiency in return. It may require a tragical crisis to teach both parties that their policies, born of avarice on one hand and resentment on the other, invite the inevitable fall of a house divided against itself.

Likewise, some years ago the public invited railroad development with promises of high reward. The fulfilment of those promises aroused public cupidity, and the rewards have been snatched away, with results equally disastrous. One of the prime contributing causes of the financial panic of 1907 was the paralysis of industry brought about by the inadequacy of the transportation facilities to serve the peak of industrial and agricultural activity. A not less serious menace confronts us today. Motive power, cars, terminals, sidings, passing tracks, and main tracks are all insufficient for the present day traffic. The railroads are the throat down which the country bids fair to be unable to swallow its business, and the near future may see our war-bred stimulants of prosperity hard put, even with the aid of our

now sounder banking facilities, to keep the country from choking on its own nourishment. And even worse than the loss of our industrial boom will result if we come to find our railroad plant inadequate to meet the transportation needs of our own country at war. I fear that our college professor friends may soon find need to apologize for letting their theories lead them into upholding the hands of our vindictive legislatures and commissions that have put a stop to railroad development because of their indignation over what they have thought to be the excessive rewards of those whom the public itself with glittering promises invited to provide the transportation plant without which the nation could never have achieved its present eminence in the world of men and affairs.

C. C. JAMES.

THE CANADIAN RAILWAY PROBLEM

OTTAWA, Canada.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I should be sorry indeed if what I am about to say were interpreted as showing a feeble appreciation of William F. Tye's efforts to solve the existing railway problem in Canada. That problem is exceedingly grave, and any suggestion which a man of Mr. Tye's ability may make should be given full consideration. He is to be congratulated on his courage and his capable treatment of a complex matter. I read his contribution to the *Railway Age Gazette* of February 23, 1917, with the deepest interest. It is a pity, however, that he marred his splendid analysis of the situation by a most misleading reference to the Intercolonial Railway. In his obvious attitude of opposition to government ownership he departed from the judicial spirit which one had a right to expect.

I am not an advocate of state control, nor am I an opponent of the underlying principle; but I cannot permit to go unchallenged the statement that, while it cost the Canadian Pacific in 1913 $70 to earn $100, it cost the Intercolonial $209. I quote his exact words:

"In the year 1913 (which was a favourable one for the Intercolonial) it cost the owners of this road—the people of Canada—including interest on the cost, $25,832,136 to earn $12,349,296, while it cost the Canadian Pacific (the shareholders) $90,562,161 to earn $129,481,885. In other words on the Intercolonial it cost $209 to do $100 worth of business, while on the Canadian Pacific it cost $70 to do $100 worth of business."

In 1913 the operating cost of the Intercolonial balanced earnings, and in 1916 it cost precisely $85 to earn $100. It is only by piling up and compounding accumulated interest for 48 years that the figures used by Mr. Tye have any application at all. When a comparison is made between operating revenues and operating expenses, two definite and well-understood things, there is no defense whatever for ringing in such arrearages. Not one man in a thousand who read Mr. Tye's figures would carry away in his mind any other impression than that the operating cost of the Intercolonial had been $209 for every $100 of earnings in that particular year. It was actually nothing of the kind. I say this, in all frankness, while feeling that the Canadian people are under a distinct obligation to Mr. Tye for going so thoroughly into a problem the solution of which will inevitably tax their sagacity and resolution to the full.

J. L. PAYNE.

PULLMAN PASSES FOR RAILWAY EMPLOYEES

PITTSBURGH, Pa.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

The letter signed "Clerk" in your issue of February 23, anent one of the reasons why college men do not now find railroad service attractive, is very much to the point, particularly the concluding paragraph. A man cannot help but lose some of his self-respect when compelled to present a pass which limits him to the use of an upper berth; not, perhaps because of any great discomfort from riding therein, but because of the fact that he is as one set aside as unworthy of as good accommodations as his fellow travelers. And when a man loses self-respect, even though it be for a trivial cause, his efficiency suffers and he learns to look with disfavor, almost with hatred, on the employment that forces such a humiliation on him. It is argued that inasmuch as the Pullman Company is granting a privilege, it is only fair that the more remunerative lower berths be set aside for the pay passengers. But why should the poor railroad man, who is compelled by the duties of his position to spend many nights aboard trains, putting in many hours away from his home, for which he receives no additional pay, be the sufferer? There are many clerks, traveling auditors and minor officials who are embittered because of the unfair discrimination in this matter. For, mark you, it is only the minor men in the service who suffer—the men "higher up" are not restricted.

If it is absolutely necessary, on account of the earnings of the Pullman Company, to get the trivial difference in price between a lower berth and an upper, why not restrict all passes alike, and give the railroad man the privilege of reserving in advance what accommodations he wants by paying to the Pullman Company the difference above the cost of an upper, the difference to be included in his expense account and paid by the railroad.

ANOTHER SUFFERER.

THE COLLEGE MAN IN RAILROAD SERVICE

NEW YORK CITY.

TO THE EDITOR OF THE RAILWAY AGE GAZETTE:

I was much interested and rather astonished at the letter in your issue of February 23 giving reasons for college men not entering the railway service.

Your thought in this matter I consider erroneous, however. The main reason that college graduates do not enter and continue in the service of railways is lack of salary given this class of men. An official of one of the big coal roads of the East said that he wanted technical college graduates to be placed in important positions after a period of "education" in the railroad service. The trouble is right here, that during the period of "seasoning" the railway wishes to pay college graduates laborers' wages and the railways think the college men should be satisfied. (It might be added that "seasoning" is never less than five years and usually from eight to ten years.) I sincerely hope that an awakening will soon come, for the technical graduate must live and it is usually necessary for him to live reasonably well, on account of the business men he comes in contact with on company business. Yet if a careful analysis were made it is not far from the truth to say that, of the college men in the railway service, say five years after graduation, very few earn better than a mere existence.

The railroad service gives a man a very versatile experience and shows up very plainly how he can stand up "under fire," but when this ability to withstand pressure is not rewarded in any way and all that comes from superiors is a call for "loyalty to the company" when financial reimbursement is asked, a technical man loses faith, especially when he is usually only existing, not really living.

The experience gained in railroad service is excellent, but unless the managements of our railroads change their methods, they will find that even more technical graduates will get their experience from the railways and then follow some other line which recognizes a man's worth with something more than loyalty (so-called).

I write this in defence of the technical graduate.

ONE OF THEM.

Interlocking Type of Cribbing 13 Ft. High

Some Economical Types of Retaining Walls

The Use of Ties in the Form of Cribbing Led to the Development of Substitute Constructions in Concrete

By C. P. Richardson,
Assistant Engineer, Chicago, Rock Island & Pacific, Chicago, Ill.

DURING the construction period of grade separation work on the Chicago, Rock Island & Pacific, between Seventy-fifth and Eighty-third streets, Chicago, approximately 33,000 sq. ft. of cribbing surface, varying from 3 to 16 ft. in height, was used as temporary supports for embankments. The project in question required a separation of grades between the Rock Island and the Chicago & Western Indiana at Seventy-ninth street, and on account of operating conditions and construction costs it was deemed most economical for the former to take the upper level. Because of the great elevation required, the construction work necessitated the building of walls and embankments, ranging from 20 to 40 ft. above the natural ground level. The line passes through a residential district with an available width of right-of-way of 100 ft., and as it was practically impossible to obtain any additional right-of-way for construction purposes, the traffic, which was handled on three main tracks, occupying the central portion of the right-of-way, was detoured to the west in order that work might proceed.

Cribbing Made of Ties

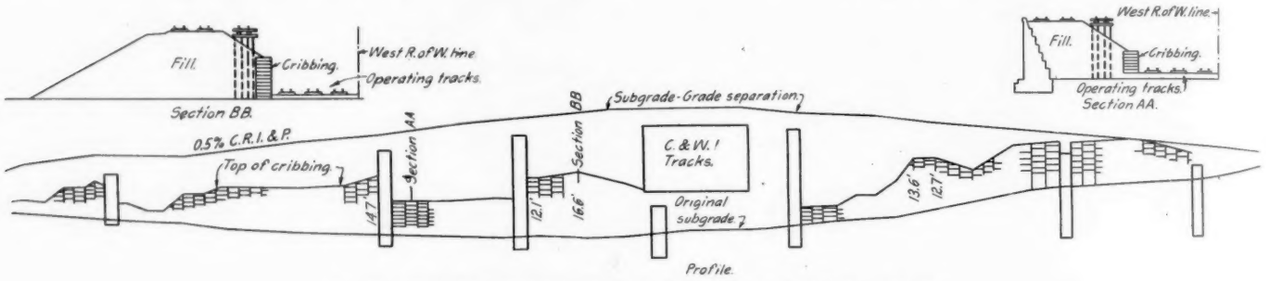
As the remaining property was insufficient to care for the embankment slopes for the future tracks on the elevated grade, it was necessary to devise some arrangement to support the embankment temporarily, without endangering traffic on the operating tracks below. A thorough study of the problem resulted in the adoption of timber cribbing for the support of sufficient embankment for a two-track roadway and the construction of one line of trestle on the location of the third track, as shown in sections AA and BB on one of the accompanying drawings. It will be noted that the cribbing varies in height and line, owing to the fact that in some cases additional property could be obtained for the temporary tracks.

The cribbing was constructed of ties which had been removed from tracks and were valueless for further service. As a general rule, front and rear lines of stretchers were used, and headers placed every tie length, with broken joints, all ties being spiked together with 10 or 12-in. boat spikes. The cribbing was constructed to heights varying from 3 ft. to 16 ft. 6 in., as conditions required, and four strands of No. 8 wire were used to tie the face of the cribbing to the adjacent timber trestle where the height exceeded 10 ft. Cribbing less than 5 ft. in height was constructed with the rear line of stretchers omitted. In many cases two or three rows of ties were spiked on the top of the cribbing and wired to the trestle for support, to prevent stones or boulders from rolling over the top of the cribbing onto the operating tracks.

The construction of cribbing was started in January, 1914, and continued as filling progressed, thus supporting the embankment pressure until traffic was placed on the elevated tracks in November, 1914. After that it carried the additional pressure of the superimposed train load on two tracks until November, 1915, when construction work was completed on the west side of the right-of-way. No failures were noted during the entire period that could be attributed to the pressure of the embankment slopes, or to the traffic, until excavation work started on the west side. At this time a heavy clay dumped on the top of the slope behind the cribbing caused a heavy surcharge in excess of the 1½ to 1 slope previously used. This additional load caused a maximum movement of 2 ft. in the distance of 50 ft. effected. The maximum movement occurred at

about two-thirds of the height, with the top moving out about one-third of the maximum, the bottom remaining fixed.

From the results obtained it would appear that timber cribbing, well constructed, as above described, is economical and safe for supporting embankments temporarily during construction. The slope behind the cribbing should not exceed the angle of natural repose of the soil, and for safety, the height of the cribbing should not exceed 10 ft., unless it can be by wire or otherwise supported from an adjoining wall or trestle.

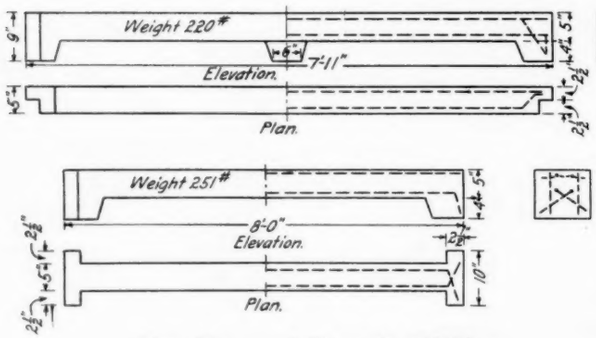


Profile Showing Extent of the Timber Crib Retaining Walls

Concrete Cribbing

The satisfactory results obtained in the use of this cribbing, made out of old and useless timber, led to the testing of the value of this style of cribbing constructed of concrete. Two types of concrete cribbing were developed and used as a substitute for a retaining wall in connection with a two-level embankment, as shown in two of the photographs.

The members of the dowel type cribbing are similar in design to the ordinary wood cross tie. The headers were made 8 ft. in length, with a 6-in. square cross-sectional area, expanded to 6 by 8 in. at a distance of 8 in. from each end. The stretchers were made 8 ft. in length with a uniform 8-in. square cross-section.



Two Forms of Concrete Cribbing

In placing the members, the stretchers were bonded to the headers with ⅝-in. rods, dropped through ¾-in. holes left in both ends of the stretchers and in the front end of the headers. All ties were reinforced with four ½-in. twisted square bars, to afford sufficient strength to withstand handling.

Cribbing members with interlocking ends were constructed with 5-in. square section. The ends of the headers were made with two projections 2½ in. long at each end in plan, and with a 4-in. projection 6 in. thick at each end in elevation, so as to form an end area of 9 by 10 in. The stretchers were made with the ends notched 2½ in. to match the headers, and a 4-in. projection in elevation to form an end area of 5 by 10 in. An additional 4-in. projection, 6 in. wide, was placed in the center of each stretcher to give support and to allow the stretchers to be laid with broken joints, thus forming a more compact wall. All ties were reinforced with ¼-in. square bars.

Only a small amount of the dowel type cribbing was used, as the weight of the pieces was such as to make it uneconomical to handle them by hand, and it is not always practical to furnish a derrick for the small pieces of work for which this cribbing is adaptable. The members of the second type, with interlocking ends and smaller cross-sectional area, are much lighter and can be handled easily by two men.

A photograph shows this type of cribbing wall built with a front batter of one inch to the foot, to heights varying from 10 to 13½ ft. This cribbing was placed in the latter part of 1915 on a new embankment 20 ft. high, supported by a retaining wall 19 ft. in advance. After a year's service no signs of failure have been noted. The embankment was thoroughly settled with water before the cribbing wall was placed, and only a slight subsequent settlement has occurred.

High Crib Wall Made of Old Ties

Experience has shown that this type of construction forms a very compact wall, at a cost less than one-half that of the usual retaining wall. On account of its elastic

and yielding properties, this type of construction can be used in many locations where, on account of the poor foundations, the cost of retaining walls would be prohibitive. This feature will make this type of construction very valuable for many purposes.

CONGRESSIONAL INQUIRY ON RAILROAD REGULATION

Hearings before the Joint Congressional Committee on Interstate Commerce at Washington were temporarily discontinued on March 29 for at least two weeks on account of the extra session of Congress. The members of the committee completed their questioning of Julius Kruttschnitt, chairman of the Southern Pacific, on his statement which was abstracted in last week's issue, and heard a statement by Marcus P. Knowlton, chairman of the board of trustees for the Boston & Maine, who explained some of the difficulties experienced in trying to reorganize the Boston & Maine system under the necessity of complying with conflicting state laws, as an illustration of the need for federal incorporation of railroads.

Judge Knowlton explained that the Boston Railroad Holding Company, of which he is president, holds a majority of the stock of the Boston & Maine. Its stock was held by the New York, New Haven & Hartford, but after the government had brought suit to terminate the New Haven control a decree was entered by which the Holding company stock was transferred to five trustees who were to control the stock of the Boston & Maine and sell it conformably with the public interest in such a way as to end the alleged monopoly.

In October, 1914, the federal trustees found the Boston & Maine operating a system of railroads comprising 25 corporations whose lines extended into five states—Maine, New Hampshire, Vermont, Massachusetts and New York, and the Dominion of Canada.

All the trustees and the directors were confident in the opinion that the corporation could not go on and serve the public properly, without a reorganization that should diminish its fixed charges and give it a better credit.

A brief abstract of Judge Knowlton's statement follows:

The Boston & Maine Railroad is incorporated under different charters in Maine, New Hampshire and Massachusetts, having but a single capital stock and a single board of directors, and conducting all its financial affairs as a single corporation. At the same time it is a domestic corporation, regularly incorporated in each of the three states, and subject to the peculiar legislation, general and special, of each of these states in which its railroad is located; and in this respect, it is three different corporations, each without authority superior to that of the others, as neither of the incorporating states has any authority or control over either of the other incorporating states. Other railroads belonging to this system are in Vermont, New York and Canada, and governed by the laws of those places.

Everybody recognizes the fact that it is for the interest of the public, as well as for the interests of the several corporations belonging to the system, that these corporations or at least most of them, should be kept together. It has also been the general, if not the universal opinion of those who have studied the subject, that no practicable, desirable form of reorganization can be adopted without special legislation to authorize it in Maine, Massachusetts and New Hampshire, if not in the other jurisdictions also. It was the hope of the directors of the Boston & Maine Railroad and of the federal trustees that substantially uniform permissive legislation might be obtained in these three states. After extended hearings and much discussion, statutes were enacted in Maine and Massachusetts in the year 1915, giving such authority; but these statutes differ materially in their provisions, and it will be very difficult, if not impossible, to proceed under them without the enactment of amendments. In New Hampshire it was impossible to obtain any practicable statute in aid of the project. In September of last year the corporation was put into the hands of a receiver.

This corporation, being directly subject to the legislation of three different states, must make returns to the public service commissioners of each of these states and obey their orders. It is, of course, subject to the jurisdiction of the Interstate Commerce Commission. Each of these tribunals has jurisdiction over the general, as well as the local affairs of the corporation. In cases of a conflict in the laws passed by the legislatures of the different states, or in the orders of the several commissions, there would be, in some matters, great doubt as to which should control. Statutes and orders that are only local in their effect, are no doubt binding to the exclusion of others, as to permanent local conditions within the state. Those that are intended to affect the corporation generally, like a change in the amount of its capital stock, or regulations as to the issue of stock, or provisions limiting or regulating the corporate indebtedness, if in conflict with the law of another state where the company is also incorporated, give rise to doubts and uncertainties which are most troublesome.

The recent statutes enacted in Maine and Massachusetts, authorizing a reorganization, and the one reported and chiefly considered in New Hampshire, all contain a provision subjecting the directors of the Boston & Maine Railroad to punishment by fine or imprisonment for a violation of the statute. As the two statutes differ from each other in important particulars, it seems that action under either of them would involve a choice by the directors of the state in which to suffer imprisonment for compliance with the law of the other state.

I ought to say that, in connection with the continued efforts to obtain a reorganization of the Boston & Maine system, a renewed attempt to procure a permissive act in New Hampshire is now being made before the legislature in session there. There is also a bill in the Maine legislature, now in session, to obtain an extension and modification of the statute of that state enacted in 1915.

It is a long time since statutes were first enacted in New Hampshire, forbidding an increase of rates upon certain railroads belonging to the Boston & Maine system, and it has been contended that these statutes were not only prohibitive of an increase as to intrastate commerce, but also of action of the Interstate Commerce Commissioners for the increase of rates in interstate commerce. In other states there has been legislation as to rates, which was unjustly discriminating in its effect upon interstate commerce.

If a reorganization is accomplished, we shall still be subject to different codes of laws in the different states, and to the orders of different tribunals, seeking, each in its own way, to regulate the public service.

With the enormous growth of business in the United States in the last few decades it has for a long time been becoming more and more evident that the only convenient and economical way of conducting interstate commerce over railroads is by combinations of the small and short railroads into extended systems, each under a single general management, covering long distances and classified continuous movements, with as few changes of route and train as possible.

In amount and importance, especially when the long distances of its transportation are considered, the interstate commerce over railroads in the United States very greatly exceeds the intrastate commerce over these railroads. The Interstate Commerce Commission has prescribed elaborate regulations of interstate commerce over existing railroads; but Congress has never attempted to provide the instrumentalities for carrying it on, or directly to authorize the creation of such instrumentalities that should derive their sole

authority, under the Constitution, from the government of the United States.

"If the corporations that are to engage in this business through the operation of railroads were directly chartered by the United States," he said, "it would relieve the public from the great difficulty and expense of dealing with different jurisdictions having conflicting laws, and from the labor and cost of subjection to the requirements of numerous commissions, all supervising the same matters, which can be properly and completely supervised by one, and from the official salaries and expenses of the members of unnecessary corporate organizations. It would relieve from most of the difficulties in the special cases to which I have referred."

It is evident that the creation of federal railroad corporations to act as carriers in interstate commerce would have many advantages over the present method of providing separate railroad corporations in the several states where the railroads are located.

Judge Knowlton also gave a legal argument to show that Congress has the power to pass a national incorporation act.

ROD PACKING AND SWAB HOLDER

The Paxton-Mitchell Company, Omaha, Neb., has made a slight change in its rod packing, to insure the spring which holds the packing segments against the rod being applied in the proper manner. As shown in Fig. 1, a recess is formed in the outside of the packing segments for the spring, thereby making it impossible to misapply them. The general form

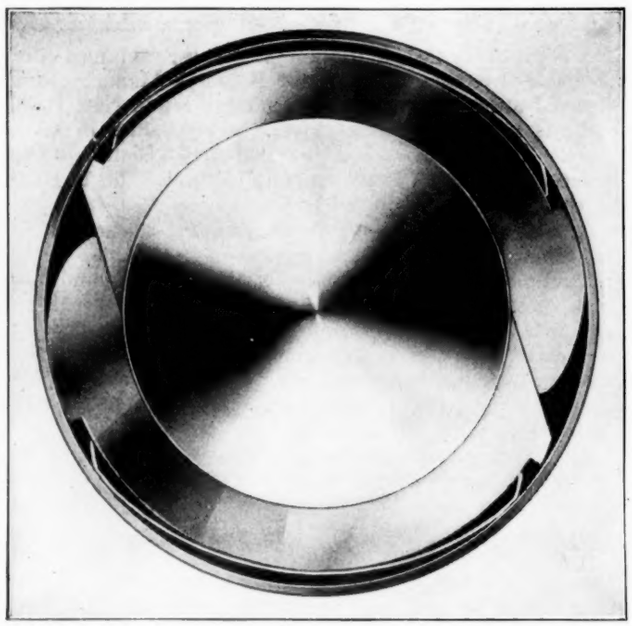


Fig. 1—Improved Type of Paxton-Mitchell Packing

of segments has not been changed and they operate the same as before. It is claimed that the segments for superheater locomotives are made of a material that will stand over 1,000 deg. F., and further, that the wear on the rod is no greater than that with saturated steam packing.

This company has also developed a new air-cooled swab holder that has been found to give especially good service. It is shown in Fig. 2. It is made of brass and was designed primarily for superheater locomotives where the high temperature is liable to destroy the lubricating qualities of the swab. The new holder has fins on the outside face as shown in the illustration, which increase the radiating surface and thus carry away the heat from the swab. Lugs cast on the back of the holder provide a ⅜-in. air space between it and the gland. This also assists in dissipating the heat. With this swab holder on a superheater Mikado locomotive it has

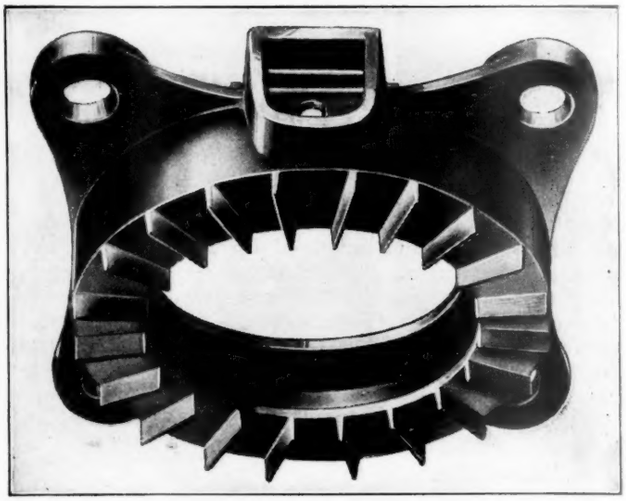


Fig. 2—Swab Holder Designed for Superheater Locomotives

been possible to keep the swab in use for two months with satisfactory results.

REPORT OF THE BUREAU OF EXPLOSIVES

Colonel B. W. Dunn, chief inspector of the Bureau for the safe transportation of explosives and other dangerous articles, has issued his annual report for the year ending December 31, 1916. The number of persons killed in accidents on railroads chargeable to explosives and other dangerous articles during the year was 7, and of injured 171; and the total property loss was $20,616,794. About 97 per cent ($20,000,000) of this loss was chargeable to the two explosions at "Black Tom," New York harbor, on July 30. The total amount of the losses in 1915 was $1,246,329; and for the four years next preceding, the annual total was never above $400,000. The number of persons killed in 1915 was 70; in 1914 it was 13; in 1913 it was 2; and in 1912 was 8.

Fires reported in 1916 as occurring in connection with the transportation of gasoline, numbered 23, with a property loss of $128,986. There is a summary of fires reported as occurring in the transportation of charcoal in the year 1916 in which are embraced 81 fires; property loss $15,956.

"Strike-anywhere" matches caused 75 fires; loss $28,543. Fires in the transportation of nitric acid numbered 51; loss $45,610. The report contains a large amount of other data including a long list of prominent cases of rough treatment of cars containing explosives.

The president of the bureau is N. D. Maher (Norfolk & Western) and the secretary is J. E. Fairbanks, 30 Church street, New York City. The number of railway lines belonging to the bureau is 422 and the number of inspections of stations made during the year was 8,063. The total number of boxes of high explosives condemned as unsafe for transportation in 1916 was 1610, as compared with 5,785 in the preceding year and 4,949 in the year before that. The number of kegs of black powder condemned as unsafe for transportation was, in 1916, 64; in 1915, 163; and in 1914, 317. The number of cars in transit inspected in 1916 was 1810, of which 66 showed serious violations of regulations. Over 500 lectures on safe transportation of explosives were given during the year.

In a special appendix (issued also in a separate pamphlet) Colonel Dunn has presented a detailed report on the Black Tom disaster. This is noticed elsewhere in this issue.

Probable Immigration After the War Is Over

Correspondent Believes United States Will Be Promised Land for High Grade Military Trained Immigrants.

By Our Special European Correspondent.

IT begins to look as if the whole question of immigration and the handling of European labor may soon have to be worked out again, and as if American railways and industrial companies would soon have to look upon this old problem in a new light and prepare to deal with it in new ways. There is every reason to believe that with the end of the war and the disbanding of the vast fabric of armies built up because of hostilities, there will be an unprecedented rush of labor to the United States. One may say what he will about the amount of labor that will be needed for the reconstruction of Belgium and northern France or to rebuild the destroyed portions of the German, Russian and Austrian frontiers. We may say what we will about the many thousands of men and women that will be required for agricultural pursuits, for the new industrial plants of Europe. But it is a fact that the people of Europe will have their eyes on the United States and will attempt to get there to recoup their fortunes.

The United States will be once again their promised land. Soldiers, women, civilians, and all the people I talk with insist that the United States has become fabulously rich by this war, and many of them have told me of their intention to go there so soon as they are permitted by the end of the war. So widespread is this feeling that it is already asserted that the governments of Europe will work in harmony with that of the United States to prevent this flux of labor from becoming too great.

This is not the expression of my opinion only; it is the result of talking with American diplomatic and consular officers in Europe. Should hostilities cease this summer, they say, it would not be surprising if the year 1918 saw our immigration reach the huge total of 2,000,000; almost twice that of the banner year 1907. The only check to this immigration will be our own laws and those of the respective European governments.

But the character and quality of this new immigration are going to be very different from any that we have yet had in our history. The literacy law of the United States which goes into effect May 1 will not determine the character of this immigration. As was shown in Italy some years ago when such a law appeared to be about to pass under the Taft administration, an unlettered man or woman can be taught to read and write well enough in three to five months to pass the test of the new law. The law will not long shut out the honest but ignorant peasant. The new immigrants coming to us will be laborers who have graduated from the armies, men who have fought for six months, a year, two and even three years, along the various fronts or worked in the munition factories.

The manhood of Europe has received a training in hard labor, in habits of sobriety and in discipline that may make it invaluable to employers. Just as those foreigners among us who worked on our railroads, in our subways, in our factories, in all our work of construction, became unusually useful in the armies which they left us to join, so these new immigrants will have been educated for us along the same lines. Further, we may be particularly sure of the quality of the man who, guided by a sense of decency and self-respect and patriotism, left us without compulsion to fight in Europe and who, his duty done, returns to us once more.

Employers will not have to fear from these army graduates any wild spirit of lawlessness bred by military service. Military discipline in these armies has, on the contrary, taught the men self-control, obedience, and cheerfulness in the face of hard work. It has rubbed off the disagreeable corners of their characters. It has even forced them to eat little, sleep lightly, and go far without complaint, indeed accept wounds and death itself with calm philosophy. Whatever of rowdiness, of swaggering, of drunkenness, there was among these soldiers at the outbreak of the war has long since been ground out of them. It is only the "tin" soldier who clings to such veneers of war. If he might, an employer should make an honorable army or navy discharge, a requisite for the employment of these new laborers.

There should rather be the fear that the war, instead of breeding roughness and disobedience among these men, should in some cases have broken down their sturdy self-reliance, as for instance with men of the Serbian army I saw after they had come over the Albanian mountains. The hardships, the hunger, the panic had left them physical wrecks, and their six months of recuperation at Corfu was not sufficient to rebuild them. Physically they looked all right but I knew their spirit was gone.

How will the American employer of labor handle these sons of the armies, these men who have had a life education of engineering, of mechanics, of plain work and vast suffering compressed into the narrow space of a year or two at war?

Will he permit them to be herded like cattle into his factories, about his yards, his place of work? Will he shut his eyes to their exploitation by their own countrymen who parade as foremen? Too often this was the treatment formerly accorded the labor which came among us during the past dozen years.

If the employer continues as of old he will not only add to our well-nigh unsolvable national immigrant problem, to the miseries of these work people and to his own labor problems, but, he will also lose a good part of the immediate efficiency of these efficient laborers. Should he decide against the old method, he will take the trouble to study the organization methods which are today holding together these immense bodies of men in Europe and leading them to insurmountable tasks and to the accomplishment of work undreamed of in the lexicon of labor.

It must not be thought that these armies are held together by the force of the military spirit. It is by the mere force of organization, and this organization has at its bottom the good, fancied or real, of every one of its members, and in each army organization there is a recognition of the human, racial qualities of each group. Thus, the German organization is a stiff one; results in fighting and work are gotten by implacable brutality. But in the French and Italian army organizations results are gotten by treating men kindly, by officers accepting soldiers as their equals, and by persuading, stimulating them to their tasks, all the while letting the reins of discipline seem loose.

An Italian general once undertook to explain to me his apparent lack of discipline. Soldiers were passing by, saluting and smiling to him at the same time, in a manner that was more friendly than respectful. "If those fellows were Germans, I couldn't let them smile in my presence and ever hope to get any work out of them again," he remarked. "But if I did not smile and seem slipshod in my discipline with my men, they would appear to be working but yet not working. These Italians of mine know that I and every

officer have their good at heart. We don't ask them to do things we wouldn't do ourselves, and we sometimes do things as an example that we don't ask them to do. Then they do them of their own accord."

As the Italians will come to the United States in greater numbers than any other nation in Europe, they having suffered less in man loss from the war and certainly as much, relatively, in money losses, it would be well to consider their character.

The character of the Italian workingman, or peasant, can be put down in a few words. He has but one big fault. He is sensitive to reproach, quick to offense. Therefore his is among the most democratic of nations. He is lazy, perhaps, in the southern parts of his own country, but under the stimulus of a colder climate this southerner quickens in his work.

Generally the Italians themselves make distinctions between the man from the north and the man from the south. The man of the north, of the regions of Milan and Turin, lives in a cold climate, is hearty, industrious, wealthy, ingenious, and as such is the backbone of Italian life and progress. It is the peasants of these provinces of Lombardy, Piedmont, and Liguria that constitutes about one-third of the 600,000 emigrants of Italy that annually go abroad to the Argentine, to France, to Austria, to Germany, and to the United States, nearly one half or some 280,000 going to the United States. But those northern province emigrants generally go abroad to work during the seasons when there is no work for them at home. Their character has never formed a problem for any employer who has taken the trouble to distinguish them from the Italians of the south and who treats them with common decency.

It is the immigrant of the provinces further south who must be studied. His employer must never hold the idea that this immigrant is a natural born thief, murderer and liar. He was in some degree these things many years ago when he lived under almost feudal conditions and was treated by various over-lords as something of a slave. The impressions he has given of these qualities among us has been partly due to the fact that the Italian government, in its efforts to get rid of the Camorra, the "black-hand," and other societies, which had their origin in the feudal system, has not been averse to permitting its bad men to emigrate to and continue their work in foreign lands.

Seen at home, as I have seen the average southern Italian, he is simple, accommodating, unmoral, (not immoral), unreligious though a church-goer, not very intelligent, happy-go-lucky, easily flattered, quick to respond to kindness, fearful of unfair treatment, patient, reasonably hard-working, and—above all—sober. His food is macaroni (or some form of this flour paste), fruit, meat, cheese, bread and wine; and this food he is ready to divide, if he be a peasant, with all comers. In the third class compartments of the trains where the peasants ride, particularly the laborers who have special rates to travel from one district to another, in the course of their work, there exists the old-fashioned spirit of hospitality. American art and architectural students who travel a great deal in all Italy have told me that they have the greatest difficulty in refusing the rough food proffered them by these kindly peasants.

Strange as it may seem, Italians of all classes have a way of speaking poorly of each other. Thus, Rossini once said: "Whenever an Italian sees a Spaniard, he should embrace him; for if it were not for the Spaniard, the Italian would be the lowest race on earth." Of course, this remark is witty but it is not fair. The poorest of Italians is charitable. If he has two cents, he will give one of them to the first beggar he meets; which explains why begging has become a trade in Italy.

In dealing with these big children, perhaps the first American reform necessary is to get away from the feudal "padrone" system, which so effectually prevents any direct relation between the employer and the man employed. The construction jobs of the United States in the past have generally been carried out by the engineer or contractor telephoning to a padrone, "I want five hundred or a thousand men for six months," after which a lump sum is paid, and the real employer has nothing further to do providing the work is done as he wishes. In railroad work the system is much the same. The Italian laborer, or the Pole, or whatever he is, generally does not know the name of the railroad he is working on and is not interested. He is working not for the railroad, in his mind, but for the padrone, the "boss," who generally manages to exploit him in his wages, his food, even his clothing, and if he rebels, the best satisfaction he gets is a discharge on the spot. One way to break up the padrone system is to have trusted men speaking the native language of the gangs. The viciousness of the contract system has been pointed out again and again, and it has been emphasized that the real employer can never hope to profit by the past training of the individual laborer, or by the particular training the laborer acquires while doing the immediate work before him.

It is not improbable that the new army graduates will not tolerate the rotten old padrone system and that they will force the employer, willy-nilly, to wake up, to speed up, to take heed of the organization forces under which this new laborer has been schooled.

The man with the labor of his hands to sell may soon occupy a strategical position. Italy is going to try to keep her laborers at home, although she may urge them to go to the Argentine. Germany, which before the war employed 800,000 foreign laborers a year, will certainly, in view of her manhood losses of the war, offer a fair field for the foreign laborer during her reconstruction and the vast speeding-up process of commercial expansion. England may offer a good field for her native labor, though the part woman is now taking there promises to help drive labor America-wards. It is also a fact that in view of the anticipated rush towards the United States, Europe really fears a yellow labor peril, and will do much to block emigration.

Such facts are but further arguments to induce the American employer of labor on a large scale to intensify his welfare plans which at present apply more at the top than at the bottom of the labor ladder.

THE SALE OF CITY WATER TO RAILROADS*

By C. R. Knowles

Superintendent of Water Service, Illinois Central,

Chicago, Ill.

During the year ending June 30, 1916, the Illinois Central purchased water amounting to over $100,000 from 34 water plants in Illinois alone. This is an average of nearly $3,000 per year per plant. At none of the points included in the above figures does the annual expense for water fall below $600 and at some points (Centralia, for example) the expense for water amounts to over $12,000 annually. Using the water purchased by the Illinois Central in this state as a basis, the railroads of the United States purchase annually from city plants over $10,000,000 worth of water. This represents no inconsiderable proportion of the revenue from the operation of these water plants.

The consumption of water for all purposes by the railroads of the country is estimated to be nearly 700,000,000,000 gal. per year. Compared with this enormous figure the water purchased from city plants is small, and it would appear that the railroads are undeveloped as a field for the sale of water. This brings up the question as to what should

*Read before the Illinois Section of the American Water Works Association, Champaign, Ill., March 13.

be the relation of the railroad to the city water plant. Should it be the same as that of the ordinary householder using only a few thousand gallons, or that of a large, long hour, high load factor consumer, whose business permits of utilizing the reserve pumping capacity, thereby increasing the efficiency of the plant?

The cost of supplying water may be divided into two charges: first, the fixed expense or cost of readiness to serve, which remains the same regardless of whether the plant is operated to full capacity or not; second, the operating expense which varies with the amount of water pumped. Assuming the plant has ample reserve capacity, the cost of furnishing water to the railroad or other large consumer will consist of the fuel, chemicals, oil, waste, etc., and any return in excess of the actual operating expenses for such water furnished may be applied to the reduction of the overhead expense, to other consumers.

Companies furnishing electricity for power are probably the most efficiently conducted public service institutions in existence. This efficiency is largely attained through operating the power plants to as nearly full capacity as possible by securing an output for the power produced through attractive rates to large consumers utilizing the off-peak load. The prevailing rates for electric power in Illinois are from 4 to 11 cents per kilowatt hour. Special rates for large, long hour, high load factor consumers and discounts for off-peak service, however, bring the cost down to 1 and 1½ cents per kilowatt hour. The electric power companies have made these low rates for two reasons: First, that the highest efficiency is attained when the plant is operated under full load and from the realization that there is a limit to the charges that may be made for electricity, that limit being reached where the cost of current equals the cost of steam or other power. The same thing is true of a railroad water supply. The limit is reached in the cost of water from city plants when the cost equals or is in excess of what it will cost the railroad to pump its own water. The railroad is in a position to say what the water should cost by reason of having a water department organization and perhaps in this respect has a different relation to the water plant than other large consumers. The fallacy of a universal rate for water to all consumers regardless of consumption is recognized by most waterworks managers, and sliding scales of rates are established in many instances. These rates are, of course, based upon all expenses, fixed and otherwise, and do not provide for differential treatment of large consumers where it is necessary to make certain concessions in order to hold the business or secure new custom.

No better exposition of the advantages of differential treatment of customers can be given than that of Knowles and Scharff in their paper on "The Relation of Out-of-Pocket Cost to Rate Making," in the proceedings of the Illinois Water Supply Association, 1914, as follows:

"There remains, then, only the second basis which seems to us proper as a reason for differential treatment of consumers—in order to lower the cost to other consumers by retaining custom which would otherwise be lost. How this works out may be very readily explained. Assume a small waterworks with a gross income of $35,000, which must be collected when it is supplying 1,000,000 gal. per day. Now suppose one large consumer using 100,000 gal. per day and paying $3,500 per year should find that he could secure water elsewhere at a cost of $2,500 per year, and should disconnect from the mains. The amount supplied would drop to 900,000 gal. per day; but interest, depreciation and maintenance would remain practically the same. It would still be necessary to have the same number of engineers and firemen; and the only saving would be a small amount of fuel, alum, hypochlorite, oil and waste, etc., which would certainly not be in excess of $1,000 per year and would probably be a great deal less, so that the gross income to be raised might be reduced to say $34,000, all of which would have to be raised from other consumers. Now, if all other conditions remained the same, and the rate for the large consumer were reduced so as to just hold his custom, when paying $2,500 per year, the total gross income would still be $35,000 and the portion to be raised from consumers other than the large one would be $32,500, or $1,500 less than in other cases. Their rates could, of course, be correspondingly lower than would be necessary if the large consumer were lost. The advantage of such an arrangement to all of the consumers is obvious, and such differential treatment, if neccessary to secure this advantage, would not only not constitute discrimination, as we have defined it, but would appear to be a plain duty of the waterworks as a public utility.

"In brief, it is to the advantage of all consumers that large, long hour, high load factor consumers be retained. Differential treatment of them does not constitute discrimination, so long as it will result in advantage and saving to other consumers. Such concessions in rates, however, must not be greater than actually necessary to meet the competition of other sources of supply, as in any case they must not be so great as to increase instead of decrease the income to be collected from other consumers. Thus in the case cited above, if it were possible to get the business at $2,500, any rate less than that sum would constitute discrimination. While if it were really necessary in order to meet competition, any rate greater than $1,000 per year would effect some saving for other consumers, and would be justifiable. A rate less than $1,000, however, would make the amount to be collected from other consumers greater than if the large consumer ceased entirely to take service. This would certainly be discrimination under our definition."

In view of the facts as to ratemaking as brought out above it would appear that in many instances more attractive rates could be made the large consumers, such as railroads, rather than suffer the loss of business that will perhaps decrease the income to such an extent as to make it necessary to increase the rate for water furnished the remaining consumers to make up the deficit. Aside from the advantage of the large consumer in keeping down the unit cost through absorbing a portion of the overhead or readiness to serve expense, a number of instances might be cited where the acquisition of one or two large consumers has made it possible to enlarge and improve the pumping plant and even construct new plants.

Another writer has strongly advised the waterworks managers to cultivate a wider market for the sale of water by encouraging irrigation of truck farms and family gardens. He stated further: "Water is a marketable commodity. Were as much ingenuity expended in marketing water as in electricity there is probably not a waterworks plant in America that would not be able to double the quantity of water sold." Undoubtedly there are great possibilities in encouraging new uses for water, but as water is one of the prime necessities in the operation of a steam railway, the market is already at hand and waterworks managers would have but little difficulty in finding a market for the sale of water if they would apply the same methods that prevail in other business lines, namely, to divide the profits with the customer if necessary to get the business.

WESTERN AUSTRALIA COAL INDUSTRY.—The report of the Royal Commission on the Collie Coal Industry of Western Australia recommends that locomotives for use on the state railways should in future be provided with a wide firebox similar to that in use in New Zealand, and also that the first locomotive of this type should be obtained either from the United Kingdom or from the United States.

WASHINGTON CORRESPONDENCE

WASHINGTON, April 3, 1917.

PROPOSED GENERAL ADVANCE IN FREIGHT RATES

Further developments in the campaign of the railroads for a general increase in freight rates are awaiting action by the Interstate Commerce Commission on the petitions filed by the roads asking the commission to amend its rules of tariff publication to permit them to make a general percentage advance by brief supplements to the existing tariffs. Twenty-four western railroads filed a petition to this effect with the commission on Monday on behalf of the carriers in Western Classification territory, asking that the advance be permitted to become effective without suspension and with the least possible delay.

The southern roads began planning their course of procedure at a meeting in Washington on Friday, March 30, which was attended by 50 or 60 traffic officers. A special committee, with Lincoln Green, vice-president of the Southern Railway, as chairman, was appointed to discuss the details and draft a petition to the commission, which is expected to be filed with the commission shortly. It is understood that the advance to be asked by the western roads will be the same percentage as that asked by the eastern roads, 15 per cent, but the list of commodities to be excepted from the percentage rule will probably be somewhat different from that of the eastern lines.

The western roads in their petition declared that a general advance in freight rates is necessary in order to enable the roads "to meet the financial outlay incident to the observance of the Adamson law and incident to other greatly increased operating costs, the increased cost of equipment and of capital and increased taxes, and to meet the demands of the general commerce of the country and the additional obligations that are arising in connection with the plans of national defense." It is declared that these increased costs and obligations cannot be met by the revenue derived from the present basis of rates.

The petition recites that the obligations imposed by the Adamson law, added to the great advance in wages, fuel, materials, supplies and equipment which have occurred recently, operate as continuing factors in greatly decreasing the net operating income; that additional equipment and improvements in operating facilities have become imperatively necessary due to the changes in nature, volume and general distribution of the commerce of the country, and that to facilitate the movement of such commerce and to preserve and promote the commercial and industrial interests of the country, large sums of money must be expended by the carriers for additions and betterments. It is also stated that the carriers "are confronted with the necessity of making, and desire to make promptly, adequate provision for serving the needs of the nation in railway transportation incident to the national defense," that "adequately and efficiently to carry out their obligations in this behalf and to meet the necessities of the present crisis, large sums of money must be expended in providing and preparing facilities, and serious interference with their commerce and diminutions of earnings therefrom will necessarily result from the preferred and expedited service to be required in this behalf."

The carriers also represent "that they are now in great need of, and will require in the very near future, large sums of new capital for the improvement, betterment and necessary extension of their properties and that, under present conditions, they encounter increased cost of capital in connection with financing improvements, additions and betterments and will in the future be put to the necessity of paying high premiums for capital in view of the great decrease in the net income from their properties."

The commission on March 29 allowed a not inconsiderable increase in the revenues of the coal-carrying roads when it declined to suspend tariffs naming increased rates on bituminous coal from West Virginia and Pennsylvania fields to tidewater. The rates from West Virginia fields are increased 10 cents per ton effective April 1 and the rates from Pennsylvania fields 5 cents per ton effective April 16. The commission also declined to suspend the tariffs of the Chesapeake & Ohio and the Norfolk & Western, naming increases in rates on coke varying from 10 to 65 cents per ton from West Virginia ovens to Virginia furnace points and those tariffs became effective on April 1. The coal and coke rates are those which the executives asked the suspension board to allow to go into effect at the hearing on March 22. The only protest on the part of the shippers was as to the change in the relationship. The roads had also filed tariffs providing for increases of 5 to 15 cents a ton on lake cargo coal, which have elicited many protests from shippers, and have filed tariffs increasing the ex-lake rates on iron ore by 15 cents. These will be strenuously opposed by the iron and steel interests in the Youngstown district.

The commission also allowed advanced westbound lake and rail rates proposed by the Great Lakes Transit Corporation and the Lehigh Valley Transportation Company to go into effect on March 29. The advances are 5 cents per 100 pounds and had been denied by the commission in three previous decisions. Some of the shippers objected at the hearing to the decrease in the spread between the rail and the lake-and-rail rates but H. S. Noble, representing the transit company, said it would probably ask later for an additional advance corresponding with that asked by the railroads.

A general readjustment of rates in Central Freight Association territory, which was filed by the roads in accordance with suggestions made by the commission in the 5 per cent case, is pending before the commission and has been the subject of several hearings. Representatives of the Central Freight Association lines have asked the commission to vacate its suspension orders in this case in order that the C. F. A. scale may be advanced on May 1 to the level of what they understand the commission intended it to be, in preparation for the general advances to meet the new conditions.

The commission has made public a file of telegrams and letters from shippers protesting against the general advance in rates, but more particularly against any action without hearings. Most of the protests have come from the smaller interests, although one of the first to be received was from G. M. Freer, president of the National Industrial Traffic League, protesting against any general advances on short notice.

The manner in which the railroad executives made their announcement to the commission of their plans for asking a general rate advance apparently has created an impression among shippers that the roads were seeking to rush the commission into more precipitate action than the roads had any idea of. The roads had made no secret of their intentions; in fact as soon as the settlement with the brotherhoods was made and the Supreme Court had rendered its decision on the Adamson law, the newspapers were filled with interviews with railroad officers saying that a rate advance would be necessary and figures showing the enormous increases in fuel costs and other expenses had been given wide publicity. When the executives of the coal carrying roads appeared before Commissioner Clements and the suspension board on March 22 and asked that the advances in bituminous coal rates be allowed to go into effect, it was indicated that this petition was the first move for a general advance and the fact was generally published, but when the eastern executives appeared before the full commission later in the day and presented their case informally, it was done without publicity. The conference was held at the close of the valuation hearing, when many who had been in attendance at that hearing were present, and the doors were open, but the fact did not get into the newspapers until the following day when the com-

mission placed a copy of the transcript of the proceedings on its press table. This fact, together with the urging of the railroad executives that the case be decided without suspension and the petition of the eastern roads that the advances be permitted to become effective "if possible, upon less than 30 days' notice," gave some people an impression that the roads had tried to "put over" an advance without even a hearing or notice.

President Rea of the Pennsylvania had told the commission that "It is our judgment that out of your long experience and thorough knowledge of the situation, and we believe it to be within your power, that you should, after due consideration, decide this question out of hand without any suspension."

When the point of haste was raised at the hearing for the western and southern lines, both President Holden of the Burlington and George Stuart Patterson, representing the eastern lines, made it plain that the roads had no intention of avoiding a hearing, but were seeking to have the case treated as an emergency and without the long period of suspension and investigation which accompanied the 1910 and 1913 general advance cases. Mr. Holden suggested that the effective date might easily be postponed either by the commission or by voluntary action of the carriers if necessary and the western roads, in their petition filed on Monday asked that the advance be permitted "with the least possible delay," saying nothing about making them effective in less than 30 days.

* * *

Arguments in Transcontinental Rate Case

Arguments are to be presented before the Interstate Commerce Commission at Washington on Wednesday and Thursday of this week in the transcontinental rate case, involving the relative adjustment of rates to the Pacific Coast and to the intermountain territory. Charles Donnelly, T. J. Norton, H. A. Scandrett and Fred H. Wood, attorneys for the transcontinental lines, have filed with the commission a brief and a list of exceptions to the tentative report recently submitted by Examiner-Attorney Thurtell. The general position of the roads is expressed in part by the following extracts from the brief:

"The outstanding features of the attorney-examiner's report are first, a finding that continued fourth section relief is not justified by actual or potential competition; second, a finding by necessary implication, if not by direct statement, that compelling ocean competition will return; third, a finding that the carriers should be permitted to meet ocean competition upon its return by necessary reductions in rates without further consideration of rates to the intermediate country, provided those rates have been in the meantime adjusted upon a basis declared reasonable by the commission; fourth, a finding that the existing rates to intermediate points are in the main relatively lower than rates established by the commission to territory farther east; fifth, a recommendation that, notwithstanding the finding just above stated, rates to the entire intermediate country should be radically reduced; and sixth, a finding that while the commission is without authority in this proceeding to require reductions to rates at intermediate points generally, that authority exists in connection with rates to the state of Arizona by reason of the issues presented in the complaint of the Arizona Corporation Commission.

"Except for its failure to recognize existing conditions as a justification for some present relief from the provisions of the fourth section, the examiner-attorney's recommendations with respect to purely fourth section features correspond in the main with the proposals of the carriers. The carriers have never sought to deny to the people of the intermountain country rates which were reasonable per se. They have always conceded the right of the commission in granting fourth section relief to require the establishment of rates to the intermediate country which are reasonable per se, if those then in effect are unreasonably high. They have contended, however, that present rates to the intermediate country have been demonstrated to be at least reasonably low in the frequent occasions upon which these cases have been before the commission, and, that, having been so demonstrated, subsequent advances or reductions therein should be considered in connection with other appropriate provisions of the statute and divorced from those cases in which the carriers would from time to time seek relief from provisions of the fourth section in order to meet the competition of the ocean carriers.

"To the third finding of the examiner, therefore, the carriers can take no exception. To the first, fifth and sixth they most strenuously except. In connection with the last they further assert that if fourth section relief is revoked, the commission has no authority in these proceedings to fix rates to any portion of the intermediate country. This the tentative report recognizes except in connection with Arizona, but erroneously proceeds upon the assumption that the reasonableness of the rates to Arizona is in issue. Complaint of the Arizona Corporation Commission, however, nowhere alleges that the rates to Arizona are unjust or unreasonable, but only that the exaction of higher rates to points within that state than are charged to points in the state of California results in undue discrimination under section three and is in violation of section four. With the removal of fourth section violations the complaint of the Arizona Corporation Commission is completely satisfied, and any attempt upon the part of the commission to fix rates to the state of Arizona as reasonable per se is as clearly beyond its authority as would be a similar attempt to other portions of the intermountain country.

"The report does not state whether the recommendation for withdrawal of fourth section relief is based upon a belief that potential competition is no justification for the making of lower rates to the more distant points, or upon the view that the potentiality of competition shown by this record is insufficient to have that effect. If based upon the first, it is in conflict with the commission's prior decisions in these cases and its decision in Fourth Section Violations in the Southeast, as well as the decision of the Supreme Court in I. C. C. v. Alabama Midland R. R. If it is based upon the second, then it appears upon the face of the tentative report itself in conjunction with other decisions of the commission that the conclusion reached is likewise contrary to the decisions of this commission and of the Supreme Court in the cases named, and, if followed by the commission, would result in an order void on its face as an arbitrary exercise of power. "The record of this proceeding shows, and the prior decisions of the commission in these cases find, that competition between ocean and rail lines for Pacific coast traffic constitutes the normal condition of transportation and commerce. From the earliest settlement of California to the outbreak of the European War, there was an uninterrupted ocean service between the coasts, sufficient at all times to affect and reduce transportation rates by rail. The business of people residing on the coast and of people in other parts of the country doing business with those residing there had become adjusted to this condition and the resulting scheme of rates. It may be fairly said that the commerce of the whole nation in so far as it relates to the Pacific coast, as well as the industrial and commercial development of the Pacific coast itself are based, as they should be, upon the normal condition of ocean and rail competition. The existing rail rates were made with relation thereto under the express sanction of this commission and this commission has held in a long line of cases, ending with those decided immediately following the opening of the Panama Canal, that the making of lower rates to the Pacific coast than to intermediate points in recognition of the conditions above described

did not result in undue discrimination against intermediate points.

"To justify a revocation of these orders, it must, therefore, appear that a state of facts has come into existence since they were made, under which a further continuance of those, or some other orders, granting relief from the provisions of the fourth section, would result in undue discrimination The railroad companies have taken the position that they desired to continue rates lower than those in effect at intermediate points. The coast cities and the commercial interests of the country at large, outside of those within the intermountain states, have pointed out the disturbance of normal business relations and of commerce resulting from a temporary withdrawal of relief and have joined in the prayer of the railroads. The question before the commission is not whether the policy of the railroads and those who have joined with them is wise or foolish, but whether it is lawful or unlawful."

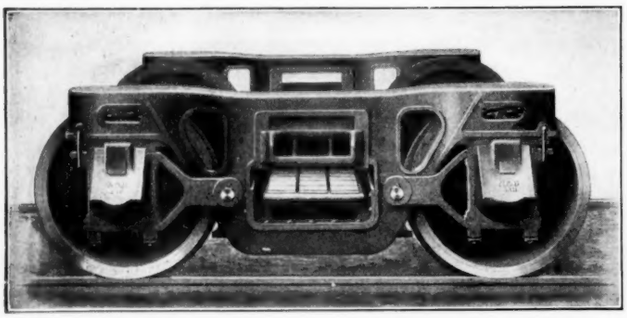
* * *

RAILWAYS PREPARE FOR MILITARY TRAFFIC

The Special Committee on National Defense of the American Railway Association is making active preparations for co-operation with the War Department in the transportation of troops and supplies. The committee has opened offices at 345 Woodward Building, in Washington, where a force is at work under the direction of George Hodges, assistant to the general chairman of the committee, and the organization which the committee has been building up is practically completed. The organization includes sub-committees on military equipment standards, military passenger transportation, military freight transportation and military accounts. There is also a representative in each of the army department headquarters and a representative at each state mobilization camp, as well as an accountant at each mobilization camp. The district committees of the general committee on national defense have also been working in co-operation with the department commanders.

ARTICULATED TENDER TRUCKS

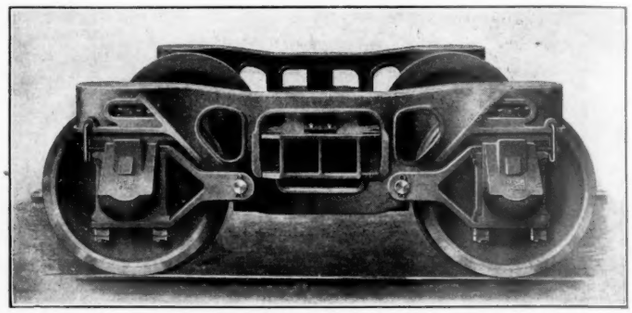
A pedestal truck that has all the advantages of the common pedestal truck and eliminates the wear on the pedestals and journal boxes has been developed recently by the Economy Devices Corporation, 30 Church street, New York City. It also permits the use of the standard M. C. B. journal box. This truck is made in two types; one is designed for passenger and fast freight service and the other for freight and



Articulated Truck for Tenders of Passenger Locomotives

switching service. Both are shown in the illustrations. The journal box and pedestal wear is overcome by pivoting the boxes to the side frame. Triple coil springs placed directly over the journal boxes support the side frames and relieve them from a large amount of shocks to which they are subjected when they rest directly on the box. This design also brings a larger amount of the truck weight on spring supports.

The spring seat for the triple coil springs is a dish-shaped casting, which is designed to transmit the lateral thrust of the truck to the journal box and thus relieve the pin connection of the journal box yoke from undue strain. This casting has an ample bearing in the side frame and is the part that bears the most wear. A lug with a hole is cast on the upper edge of the spring seat casting. It may be seen in the frame opening above the journal box. When the wheels are to be removed, a rod is passed through this hole to keep the spring seat in position in the side frame when the frame is being jacked up. To remove the wheels, the frame is lifted until the spring seat is free from the journal box. The journal box yoke pin is removed and the wheels



Truck for Freight and Switch Engine Tenders

are rolled out. This journal box pin must be removed from the inside, and as an additional safeguard the brake hanger must be moved in order to get the pin out of the frame. Thus, while in service, if for any reason the cotter key which holds the pin becomes lost, the pin cannot work out of its hole. The journal box with the yoke attached is removed from the axle by removing the wedge and brass from the box and pulling the parts off in a horizontal direction. In no case is it necessary to remove the journal box from the yoke unless either become broken.

The side frames are made of cast steel in channel sections. the journal box yokes are also of cast steel. The trucks are designed to use either lateral motion or rigid bolsters of standard design. The passenger and fast freight trucks are provided with a triple elliptic spring under the bolster and have a spring plank 22 in. wide by 6 in. deep. The trucks for freight and switching service are of the same design and construction as the passenger truck with the exception of the elliptical springs and the spring plank. In this case the bolster is supported directly on the side frames.

COMPLETION OF RUSSIAN RAILWAY BRIDGE.—The railway bridge over the Amur River at Khabarovsk, Siberia, was opened to traffic on November 18, 1916. Its construction has taken five years and has cost 18,000,000 rubles ($9,270,000 at the normal exchange rate). It is 7,593 feet long, one of the longest bridges in the world. The completion of the Amur bridge marks the completion of the Amur Railroad from Kuenga to Khabarovsk (1,247 miles).—*Commerce Report.*

SOUTH AMERICAN RAILWAY CONGRESS.—The Peruvian permanent commission of the South American Railway Congress has just been organized, the members of this commission being officials of railways and engineering societies. The first South American Railway Congress was held in Buenos Aires in 1910, and it is expected that the second will be held in Rio de Janeiro in 1918. The newly organized Peruvian commission will make efforts to have the third congress meet in Lima in 1921, the centenary of Peru's independence, when a celebration will also be held of the first trip of a locomotive in South America, which was in Lima in 1851.—*Commerce Report.*

Hearing on Tentative Railway Valuations

Interstate Commerce Commission Completes Two Weeks' Hearing Devoted Mainly to General Principles

THE Interstate Commerce Commission on Saturday, March 31, concluded a two weeks' hearing on its first five tentative valuation reports. Most of the testimony was general in character and will become a part of the record in the cases of the Texas Midland, Atlanta, Birmingham & Atlantic; New Orleans, Texas & Mexico, Kansas City Southern and Winston-Salem Southbound, although some detailed testimony was presented with particular reference to the Kansas City Southern, Texas Midland and Atlanta, Birmingham & Atlantic cases. Further testimony in the Texas Midland case will be taken before an examiner at Terrell, Texas, beginning April 11, and in the Atlanta, Birmingham & Atlantic case at Chattanooga, Tenn., and in the Kansas City Southern case at Kansas City, Mo.; the date for the filing of briefs in the Texas Midland and Atlanta, Birmingham & Atlantic cases has been tentatively set for June 1. The following is a summary of the principal testimony introduced following that reported in last week's issue.

Kansas City Southern Case

L. F. Loree, chairman of the Kansas City Southern, told the commission that the road could never have been promoted and financed under the conditions assumed by the division of valuation for its reproduction. Asked what would be a proper allowance for the cost of obtaining money and interest during construction, Mr. Loree said the money would have to be raised on the basis of a prospectus in which the cost of reproduction new as determined by the division of valuation would be the basis. It would be necessary to make an arrangement with a banking house for financing the enterprise and he thought the first obstacle to be confronted would be an adverse report by the engineer assigned by the banking house as to the validity of the estimate for construction. His attention would be directed to the scheme of construction which contemplated using a road which had no existence for hauling supplies. He would find that the people who had made the estimate had estimated the engineering cost in June, 1916, at $601,635 and in the tentative valuation at $1,269,053. Then Mr. Loree thought the item of clearing and grubbing would be challenged, because the conception of the estimators was that where no forest was visible no clearing and grubbing would be required, but when they came into a town and found a built-up section to be traversed, their view changed and they visioned a right-of-way free from all improvements. The engineer would also challenge the land estimates and the time to be consumed in building the road. Whereas the division estimated this at 30 months, Mr. Loree thought an engineer would report to the bankers that it could not be done in less than 48 months. He would also call attention to the fact that no provision had been made for working capital to conduct the business of the enterprise nor to furnish it with materials and supplies, nor for terminals at Kansas City or Joplin. Then, Mr. Loree said, consideration would have been given to the depressed condition of the district at the time when most of the roads in that territory were in receivers' hands and he did not think it would have been possible in 1914 to have financed the enterprise at all.

Mr. Loree said he did not offer this criticism in any carping spirit, because the Kansas City Southern was one of the first roads to be examined and the work was entirely new to the division, as well as to the railroad, and he did not mean to criticize except to call attention to the things that he thought made a revision of the tentative report necessary. The tentative report allows interest during construction at 6 per cent for half of the construction period, but makes no allowance for the cost of obtaining money in advance.

Mr. Loree said he did not think the estimated cost of reproducing an existing road is likely to be arrived at much more accurately than the estimate of the cost of building a new railroad and, therefore, any computations based on that method would produce less than the actual cost. He thought the commission would be much helped in determining the validity of these estimates of the cost of reproduction if it were able to compare them with the actual original cost to date. The figures that were assembled by the Kansas City Southern on the original cost to date amounted to approximately $50,000,000 and he thought tended to discredit the estimate that the road could be reproduced for something like $48,000,000, especially as the original construction of the road was during a period of very low prices for material and labor and there was a substantial difference between the prices in 1914 and those in the period 1893 to 1898. He thought the original cost to date was susceptible of ascertainment on most roads.

On cross-examination, C. A. Prouty, director of the division of valuation, said the division had determined the original investment of the company and that its figures differed from the original cost figures of the road by only about a million dollars. The railroad, he said, had included about $2,000,000 for contractors' profit, which might be proper enough in determining what the property ought to have cost, but not as showing the money actually paid out. Mr. Loree said that if the original cost in 1893 to 1898 was $50,000,000 it certainly could not be produced in 1914 for that cost, to which Mr. Prouty replied: "Our opinion is that in 1914 a railroad could be produced as cheaply as it could have been produced on the average during the last 25 years."

Mr. Loree referred to the lines of the company at Port Arthur, on which the railroad had placed a valuation of $3,251,285 as against $646,641, the value submitted by the division of valuation. He said the division's figure was $600 an acre, whereas the line was assessed for taxation purposes at $800 and it has a peculiar value, not only for railroad purposes but because of local conditions, and Mr. Loree thought he could market the land at $2,500 an acre. Mr. Prouty said that for the purpose of reconciling the difference the railroad and the division had each assigned a man to appraise the property and that the railroad's expert had appraised it at $699,000.

Director Prouty remarked that the estimate of the cost of reproducing the road was made by the government and asked if the government would have any difficulty in borrowing $50,000,000 to reproduce the Kansas City Southern. Mr. Loree said that it would not have any difficulty on the basis of the government's general credit, but on the basis of this particular enterprise it would have, because a railroad that is going to be reproduced has no credit. In reply to a question by A. E. Helm, representing the Kansas Public Utilities Commission, Mr. Loree said the credit of the Kansas City Southern has been very seriously affected by the tentative valuation report. Director Prouty said the division's estimate of the cost of reproduction was about $46,000,000 and the estimated value of the lands about $4,500,000, which made the reproduction estimate a trifle more than the money actually invested.

Director Prouty asked if Mr. Loree could not give some

testimony on the subject of "other values," a point about which he said the division, and, so far as he knew, the commission, is utterly helpless and does not know what to do with it. S. W. Moore, solicitor for the Kansas City Southern, said that until the intangible elements of value have been proved, he was not in a position to have witnesses put a valuation on them, but expected to do so at a later date. Commissioner Clark then asked the witness if he would not offer some constructive suggestions, to which Mr. Loree replied that there are elements of value, both tangible and intangible, which constitute an important part of the value of a railroad and which had been stated in the company's protest, such as the items of working capital, materials and supplies, elevators and the interest of the company in the terminals at Joplin and Kansas City. These items, he thought, should be included in the cost of reproduction, but, if not, they should be included under the head of "other values or elements of value." He thought the item of appreciation should appear under "other values" as it is a substantial item in the value of a going concern. The director said he was prepared to include such items, but was troubled as to the figures to use. Mr. Loree said that some proof on that point would be offered at the Kansas City hearing, and he mentioned also the items of abandoned property, franchise, good will, etc., on which the company pays taxes, the fact that the road is unusually well operated and can be operated on the ratio of approximately 60 per cent of the operating revenues, and the fact that the company operates through a developing territory. Solicitor P. J. Farrell of the division of valuation, asked if those elements were not all reflected in the net earnings of the company. Mr. Loree replied that it would be more accurate to say they were reflected in the gross, because the net earnings are affected by so many other considerations.

Land

For the purpose of showing the excess cost and value of railway right of way as compared with adjacent similar property, H. S. Marshall, land assistant for the western group of the Presidents' Conference Committee, W. R. Van Campen, land attorney for the eastern group, and Charles Silliman, an engineer in the office of the southern group, introduced a large amount of data obtained from the roads in response to a circular issued by the general secretary. Mr. Marshall introduced statements covering 152 reports on the cost of land from 20 roads in 21 different states.

Reports covering 3,929 miles of right-of-way for new lines, a total of 60,952 acres, showed that the purchase price was $8,941,231. The naked land value was $3,411,813, or 38.16 per cent of the purchase price, and the expense of acquisition was $537,886, or 6.16 per cent of the purchase price of the land for which the expense of acquisition was obtained. The percentage of naked land value varied from 10.49 per cent to 94.22 per cent, excluding one item in which it was in excess of the purchase price. A similar tabulation covering 256.2 miles, or 4,865 acres, purchased for changes of line, showed a total purchase price of $946,951 and a naked land value of $246,813, or 26 per cent. The expense of acquisition was $56,330, or 6.88 per cent. For second main track 806.49 miles, or 6,511 acres, was purchased for $1,936,043. The naked land value was $524,261, or 27.08 per cent, and the cost of acquisition was $63,844, or 3.20 per cent. Summarizing these tables, 4,992.46 miles, or 72,329 acres, purchased for $11,824,225 had a naked land value of $4,182,889, or 35 per cent, and the expense of acquisition was $658,061, or 5.73 per cent. The total included 12,999 transfers and 577 parcels.

Mr. Van Campen and Mr. Silliman gave similar figures for the eastern and southern territory. Pearce Horn, superintendent of real estate of the Southern, and Charles E. Rice, of the law firm representing the Atlanta, Birmingham & Atlantic, gave additional testimony regarding land costs.

Halford Erickson, formerly chairman of the Wisconsin Railroad Commission, now engaged in private practice, testified regarding the results of a special study of the relation between the purchase price and naked value of land made by the Wisconsin commission in 1913 in connection with its valuation of railway property in the state. The Wisconsin commission had endeavored to ascertain the value of the land and had made studies of what it had actually cost the railroads, the value of adjacent land, and other factors entering into the question and had used a multiple to represent the additional cost to the railroads. Mr. Erickson thought that practically every commission that had made studies of the cost of reproduction had used practically the same method. On cross-examination, he said the Wisconsin commission had endeavored to find the cost of reproduction under existing conditions and had paid no attention to the original cost in calculating the reproduction cost, and that the method necessarily involved some estimating. The fact that land might have been donated originally was not taken into account because in reproducing under present conditions very little land would be donated. The valuation was used both for taxation and for rate-making purposes, but on different bases. Glen E. Plumb, representing the railway brotherhoods, asked if the commission had taken into consideration "the public easement on the railway right-of-way" as in any way limiting the title of the railway to this property. Mr. Erickson said it had not.

Mr. Erickson's testimony brought out a general discussion as to the method of treating land values and particularly of complying with that section of the act requiring a separate report of "the original and present cost of condemnation and damages or of purchase, in excess of such original cost or present value." Pierce Butler, representing the Texas Midland, had proposed a plan for taking detailed testimony as to that road, of witnesses who could estimate what it actually cost the carrier to acquire individual parcels of land.

Director Prouty said he conceded that by the use of multiples an approximately correct result could be obtained, but that Solicitor Farrell takes the position that in the Minnesota rate case the Supreme Court had decided that that method could not be used. Mr. Prouty said he had never known any two people who agreed about the meaning of that case, but that to attempt to ascertain exactly the cost of acquisition would cost more than the value of the railroads. He said that before any further proceedings the commission ought to decide what should be done and that he "would rather undertake to recite the Chinese alphabet backward" than to read the valuation act. The section regarding the cost of condemnation and damages, he said, does not mean anything and the commission can properly say to Congress that it does not know what it means and, therefore, has not attempted to comply with it. The original cost includes the cost of condemnation and damages and the present value includes condemnation and damages. The commission might well say to Congress that this language is not susceptible of any rational interpretation or it might present the question to Congress and ask what it means. He was inclined to think that what Congress may have had in mind was the cost to the railroad to acquire the land over the value of the land itself, but the Supreme Court had decided that the original cost should not prevail and that the cost of reproduction should not prevail, and it would be no less than a crime to expend perhaps millions of dollars to conduct a condemnation proceeding as to every individual parcel of land. He hoped the commission will not ask the division to incur that expense.

Solicitor Farrell told the commission that the law division does not concur in some of the admissions made by the director. He said the Supreme Court has said that it is impossible in the absence of exact information to estimate the

present cost of condemnation and damages, or of purchase and, moreover, he asserted, that the information would be of no value if it were found.

Depreciation of Equipment

J. E. Muhlfeld, Charles E. Chambers, superintendent of motive power of the Central Railroad of New Jersey, C. A. Schroyer, superintendent of the car department, and H. T. Bentley, superintendent of motive power and machinery of the Chicago & North Western, gave testimony regarding the depreciation of equipment. Mr. Schroyer said the service life of a car does not depend on its age, but on its maintenance. By proper maintenance the service life can be continued indefinitely. His company has never retired cars because of wearing out, but only because of inadequacy or obsolescence. Because of their small size and capacity, such cars are permitted to wear out, but the company never retires cars for the purpose of replacing them with other cars of the same type because it is cheaper to repair an old car. The North Western has many thousands of cars that cannot be reproduced today for what they originally cost. It has recently completed the changing of some gondola cars and by expending $200 to $250 on a car, using steel center sill construction, applying improved draft rigging and removing the decayed or damaged parts of the timber it has obtained cars worth more than they were worth when they were built 15 or 18 years ago. They will haul the same load and the cost of maintenance will be less. The same process can be repeated some years from now. If cars are fully maintained, he said, they have the same value for transportation purposes as new ones, and if the road invests thousands of dollars in a car it endeavors to keep the car at that value by maintenance.

Solicitor Farrell asked whether a car that has been used for some time without repairs does not have less units of service remaining in it. The witness replied that there is, of course, an accruing deterioration which exists until it is overcome by a general repair, but that unless the maintenance is deferred, it is worth just as much for transportation purposes until it is time to put it through the shop. Commissioner Meyer asked a number of questions regarding the company's depreciation account which Mr. Schroyer said he had nothing to do with. The commissioner wanted to know why the company had charged 3 per cent for depreciation of freight cars, instead of some other figure, and 2½ per cent for passenger cars. Mr. Schroyer said he did not know how the 3 per cent is arrived at, but he understood the account was intended to represent cars wrecked or destroyed or retired because of inadequacy or obsolescence, and that the account had nothing to do with the maintenance account, to which repairs are charged. He supposed the difference in the figures used for freight and passenger cars is due to the fact that a passenger car is better maintained and has a longer average life than a freight car. Commissioner Clements asked if his company were in the market for 1,000 cars, whether it would just as soon buy old cars that had been repaired as new ones of the same type. Mr. Schroyer said he would pay as much for an old car as for a new one, less any increased cost of maintenance due to its age and that the difference would depend upon an examination of the physical condition of the cars.

Mr. Bentley gave similar testimony regarding locomotives, saying it is impossible to tell by examination what will be the service life of a locomotive. The purpose is to maintain in a condition of practically 100 per cent efficiency and the service life can be preserved indefinitely by repairs and maintenance. The North Western had recently installed new boilers and made other repairs to locomotives 33 years old with the result that they are now probably more efficient for the purpose than when they were new, on account of the improved design of the boiler. The locomotives were inadequate for main line use, but were adapted for branch line use and, while they originally cost $12,000, by the expenditure of $4,000 to $4,200 they are made better than a locomotive which would now cost $18,000. The different parts of a locomotive have a different service life and they are renewed as they wear out. He told of seeing locomotives on a visit to London two or three years ago which he had worked on as a boy, on the London & Northwestern, 45 or 50 years ago, and they were performing practically the same service now as then. When the North Western needs a small locomotive, the practice is to buy a new boiler for an old one, rather than to buy a new locomotive. On cross-examination Solicitor Farrell brought out that more of the old locomotives are retired than are given new boilers, and Mr. Aitchison brought out that he had not seen in England all of the locomotives which were in existence when he was a boy.

A. H. Plant, comptroller of the Southern Railway, testified regarding depreciation accounting. He said his road does not set up a depreciation fund for equipment, but maintains an account under the requirements of the Interstate Commerce Commission accounting rules to which is credited an amount for depreciation of equipment. Assuming a percentage of 4 per cent for depreciation in the case of equipment entered in the investment account at $1,000, the company would annually charge its operating expenses $40 divided into monthly periods and credit the depreciation account with $40 during the life of the equipment until the account reached 100 per cent, but this was a mere book account. Commissioner Meyer asked if a car could be maintained indefinitely whether operating expenses should be charged for depreciation. Mr. Plant replied that under the commission's rules he would be required to do so, but that if cars were maintained indefinitely there would be no need of such an account except for the destruction of equipment and retirement due to obsolescence or inadequacy, but that as a matter of fact all cars were not maintained up to 100 per cent efficiency because cars are not repaired every day and there are always idle cars needing repairs.

A., B. & A. and Texas Midland

Charles Hansel, consulting valuation engineer, testified regarding the cost of engineering. He said a certain amount per mile or a certain percentage cannot be used for all roads, but that the circumstances of each road should be taken into consideration. He thought that that part of the Virginian Railway located on the coastal plain was fairly comparable with the Atlanta, Birmingham & Atlantic, and that based on this comparison he would estimate the engineering cost for the Atlanta, Birmingham & Atlantic at approximately $1,336,932, an average of $2,140 per mile. The engineering on the Virginian actually cost for the comparable part of the line $3,237 per mile. He said the Atlanta, Birmingham & Atlantic in its protest claims 5 per cent for engineering, or $1,236,000, but that he would not undertake the work for that amount and that percentages varied with the amount and character of the work. He would rather undertake the Lackawanna cut-off in New Jersey at less than 2 per cent for engineering than the Atlanta, Birmingham & Atlantic for 8 per cent, or a tunnel under the Hudson River at 10 per cent.

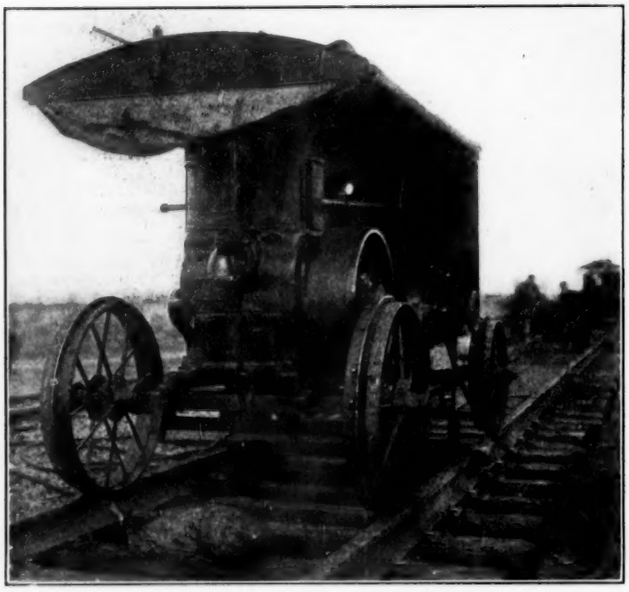
L. W. Wells, assistant to general manager and chief engineer of the Texas Midland, testified to show that the Texas Midland has been well and suitably maintained. J. S. Worley, a member of the engineering board of the division of valuation, who had had general charge of the valuation of the Texas Midland, described some of the methods used in preparing the report. He said the engineering cost had originally been calculated by B. J. Dalton, assistant district engineer for the division, but now chairman of the valuation committee of the Missouri, Kansas & Texas, who had ar-

rived at the cost by the built-up method. Later instructions were issued to use the percentage method of calculating engineering costs and Mr. Worley said that after a review he saw no reason for changing the total, and he had simply changed it into a percentage figure, 2⅛ per cent, which he thought was a fair allowance for this road, because the road was a simple one to construct, requiring little engineering, and was constructed and put in operation in six months. No separate allowance was made for contingencies, but an allowance was made for the element of contingencies in the unit prices. He said that in estimating construction, engineers invariably make an allowance of from 5 to 20 per cent for contingencies, but if the actual expenditures of the road are taken afterward as the basis, the contingencies are included in the actual figures. Commissioner Daniels asked why contingencies were included in unit prices instead of stated separately. Director Prouty answered, saying that this was done because it was thought to be a more intelligent method because there are contingencies on some items, but practically none in other items and it was thought better to include them in the items to which they pertain rather than to spread them over the entire work. Allowance for waste, he said, was made in figuring the quantities.

PLACING SCREW SPIKES WITH PNEUMATIC DRILLS

In laying the rail on the New York Connecting Railroad screw spikes have been used to anchor the 125-lb. rails. The spikes are of two types, one to hold the tie plates and a larger size for the rail itself. The smaller spikes are about 6 in. long by ¾ in. diameter and the larger ones about 7⅝ in. long by ⅞ in. diameter with a flange to grip the rail. Both have a heavy thread of ½-in. pitch and ⅞-in. square heads. Six spikes are used at each end of a tie, four for the tie plate and two for the rail.

These spikes are being driven pneumatically by Ingersoll-Rand Little David No. 11 SE reversible drills fitted with a special socket wrench which fits the spike heads. The wrench is made as short as possible, to give the machine a better balance. The drills are compound geared, weigh 70 lb. and operate at a speed of 100 r. p. m., consuming about 55 cu. ft. of air per minute. The time required for driving a single spike averages about 5 sec. for the smaller spikes and 6 sec. for the large ones. Under favorable conditions the six spikes in one end of a tie can be driven in about 45 sec. The ties are bored with ⅝ in. holes for tie plate spikes and ⅞ in. holes for rail spikes before being laid.



Gasolene Driven Air Compressor

The compressed air at 100 lb. pressure is supplied by two Imperial Type XII gasolene driven portable compressors. These are duplex vertical compressors with cylinders 8 in. in diameter by 6 in. stroke, short belt driven by four-cylinder, tractor type, gasolene motors. Each weighs about 5,600 lb. and has a rated piston displacement of 140 cu. ft. per min. These machines are the standard road portable type and have been adapted to track work by bolting a circular flanged piece to the rim of each wheel. Each compressor supplies air to two spike driving machines, one for each rail, and a wood boring machine serving both. The compressors are operated about 100 ft. apart and are easily moved by two or three men as the work progresses. The work is done by an operator for each compressor, two men with wood boring machines and four gangs of five men, each consisting of two men to operate a drill and two men with crowbars and one with a sledge hammer to line up the ties and to hold them while the spikes are being run in. This is necessary because the air drills are so powerful that they slightly turn the tie as soon as the spike is solidly seated unless it is firmly held.

Placing the Screw Spikes

The ties, tie plates and rails are laid in advance of the spiking gang, and all rail joints are completed. The average progress per ten hour day has been twenty 33-ft. rails with each compressor unit. At 20 ties per rail and 12 spikes per tie this totals 4,800 spikes, or 9,600 spikes for both outfits.

The operating cost per day of ten hours is approximately $81.45 or a cost per spike of $0.008. This charge does not include depreciation or overhead expense. The contractor for the track laying was P. McManus, Incorporated, of Philadelphia, Pa. The compressors and pneumatic equipment are manufactured by the Ingersoll-Rand Company, New York.

CAR SERVICE COMMISSION

The effect of the sweeping embargoes placed by a large number of railroads in the United States, when a general strike of train service employees seemed probable, is reflected in the reports of accumulations of freight cars—loaded and empty—made to the Commission on Car Service of the American Railway Association by the different roads for March 17. On that day 128,107 cars were being held at various points, as compared with 99,774 on March 10.

On March 10, the railroads were just beginning to feel the real effects of the "clean-up week," during which time every effort was made to rid the rails of freight that had been billed prior to February 1. Accumulations had been brought down from 171,005 cars to less than 100,000, and it was expected that still further progress would be made during the week ending March 17. The threatened strike, however, caused the placing of such drastic embargoes that the accumulations increased rapidly.

More than half of all the cars held in accumulations are on railroads east of the Mississippi river, and north of the Ohio river, in what are known as groups 2 and 3. They include the Baltimore & Ohio; Pennsylvania; New York Central; Erie; Cleveland, Cincinnati, Chicago & St. Louis; Michigan Central; Lehigh Valley; Wabash; as well as a number of smaller roads in the same territory.

Reports of cars held in accumulations show the following since February 17, when the high water mark was reached since the present congestion became acute:

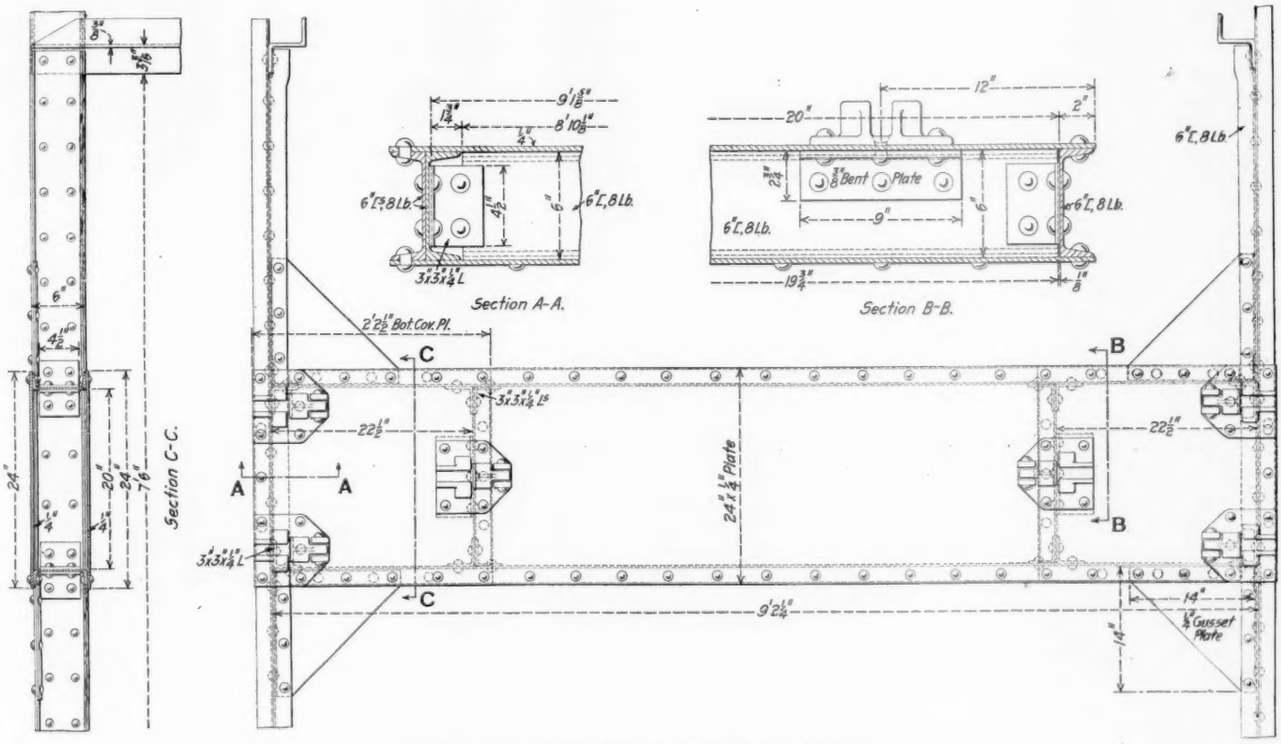
February 17	171,005
February 24	143,550
March 3	123,063
March 10	99,774
March 17	128,107

It will be seen from the above figures that in the week ending March 17, there was an increase of 28 per cent in cars held in accumulations.

The Commission on Car Service has decided to continue during the month of May the 75 cent per diem rate, although a number of roads have protested to the commission that such a high rate is working a hardship upon them and have asked relief. Among those that have been before the commission to ask relief have been a committee representing the Short Line Railroad Association of the South, E. J. Pearson, vice-president of the New York, New Haven & Hartford, and F. H. Alfred, general manager of the Pere Marquette, and the commission has taken their arguments under advisement. Arrangements have been made for a meeting in Washington with a committee representing the Association of Transportation and Car Accounting Officers for this week or next to discuss the code of car service rules that went into effect in February and suggestions for possible changes in the rules, many of which have been submitted to the commission. The commission has had considerable correspondence with roads that have not signed the agreement for the observance of the code of car service rules and the Interstate Commerce Commission has taken the matter up with the executives of the Wabash; St. Louis-San Francisco; Missouri, Kansas & Texas, and St. Louis Southwestern to ask why they have not signed the agreement and to ask them to explain their present methods of handling cars. The matter is also to be taken up with other roads that have failed to become parties to the agreement.

SPECIAL TIE CARS FOR THE SANTA FE

The practice of providing special cars for transporting ties has been followed by many railroads, and often when box cars are used a part of the siding is cut away to facilitate loading and unloading, but the special tie cars recently built for the Santa Fe are designed especially for this service. The construction of these cars is such that the ties can be handled by power, and where a crane is available an entire tier can be removed from the car at one time. It is planned to use a winch, mounted on a special car, with each tie train. A cable will be run along the cars, special fastenings being provided on the sides of the cars for sheaves which carry the cable. A detachable overhead tackle support for drawing

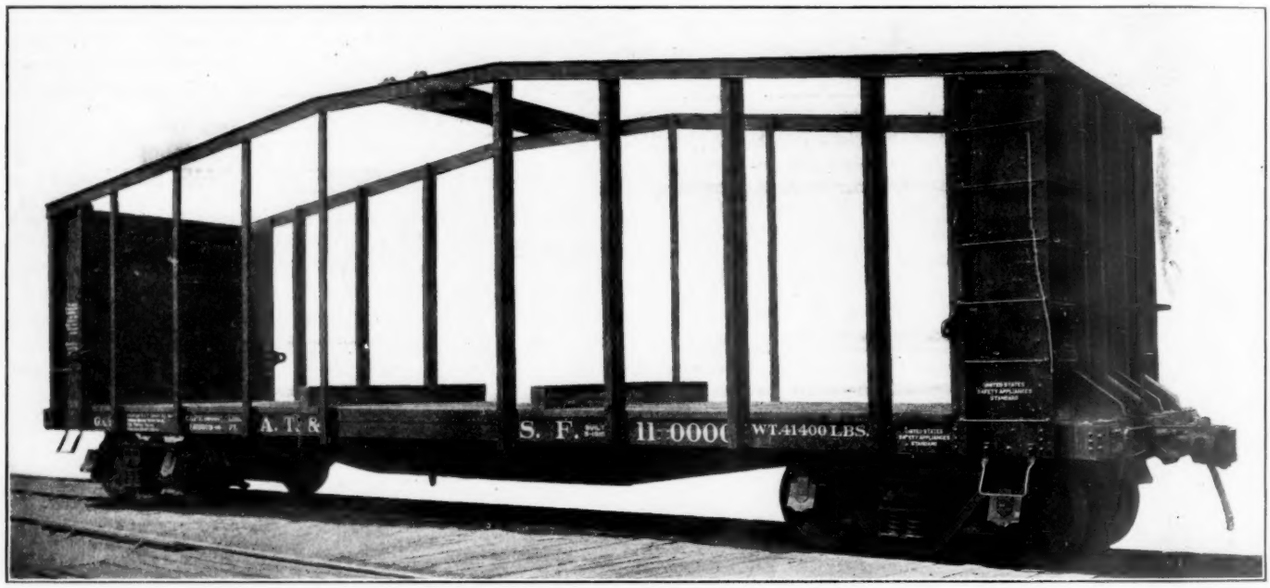


Center Top Connection for Santa Fe Tie Car

ties to the car and hoisting them is fastened to the superstructure. The fastenings for this support will be noticed at the end of the center top connection.

As will be seen from the illustration, heavy ends are provided to take the shocks of shifting lading, and 4⅛-in., 12.5 lb. Z-bar side posts hold in the ties at the sides. In order to insure ties being placed in the car as provided by the loading rules, four cross blocks are provided, spaced so as to hold up the ends of each tier. The side posts are riveted at the top to a 6-in., 8-lb. channel extending from end to end of the car. The channel is raised in the center and reinforced between the two center posts. At the center of the car there is a connection between the longitudinal channels, made up of two 6-in. channels with a ¼-in. cover plate 24 in. wide. The pockets for holding the overhead tackle support are placed at the ends of this cross member.

The cars are 40 ft. long inside and 42 ft. 6¾ in. over the end sills. The height from the top of the floor to the top of the channels is 10 ft. 2½ in. at the center, and 8 ft. at the ends. The underframe has fishbelly center sills and channel side sills, a type of construction used on many Santa Fe cars. They are built entirely of steel with the exception of the wooden deck. These cars were designed by E. Posson, engineer of car construction for the Atchison, Topeka & Santa Fe, at Chicago, in collaboration with G. E. Davidson, of the Kirby Lumber Company, Silsbee, Texas. The Haskell & Barker Car Company have built 400 cars of this type.



Tie Car for the Atchison, Topeka & Santa Fe

WAR TIME IMPROVEMENTS IN ITALY.—During the last two years, new works have absorbed some £4,320,000 ($20,995,200), as compared with a normal annual expenditure of about £1,200,000 ($5,832,000). About 160 km. (99 miles) of new line have been opened for traffic, and various sections are on the point of completion, including new branches on the important Genoa-Milan line. This by no means exhausts the record, since 235 km. (146 miles) of single line have also been constructed at a cost of slightly under £1,000,000 ($4,860,000), while £1,800,000 ($8,748,000) are being spent on the rebuilding of a further 350 km. (217 miles). Fifteen new junction stations have been built, and electric signalling apparatus has been laid down on 140 km. (87 miles) of track, with electric signalling installations at 146 stations.—*Railway Gazette, London.*

THE PURPOSES OF THE LOCOMOTIVE INSPECTION LAWS AND RULES*

There can be no question that federal laws requiring better maintenance of locomotives not only promote safety of employees and travelers, but are a direct benefit to the railroads from an efficiency standpoint.

Some railroad officials and employees appear to regard the passage of laws to promote safety as a reflection on the sincerity of their efforts to prevent accidents or on their ability in that direction, and as an unnecessary restriction of the rights of the company. These views may seem to be partly right and yet are entirely wrong. No one questions the fact that railroad men as a class are actuated by just as keen a desire to conserve life and property as anyone. The railroad operating organization, however, is a steam-driven, high-speed machine which is worked to its capacity and the pressure is increasing each year. Federal laws are safety valves to regulate this pressure and prevent it from wrecking the machine.

Under the law the duties of the Federal Locomotive Inspection Bureau are administrative, and the final determination of disputed points is a function of the courts. It is a well established rule of law, however, that the practical interpretation of a law or rule by the department charged with its administration is entitled to the highest respect and if acted upon for a number of years will not be disturbed except for very cogent reasons.

Under date of March 4, 1915, an amendment to the locomotive boiler inspection law, extending its provisions to the entire locomotive and tender and all parts and appurtenances thereof, was enacted, making a locomotive inspection law out of what was formerly a locomotive boiler inspection law. The method provided by the law for enforcing compliance with its provisions is important. Recognizing the impossibility of 50 federal inspectors actually inspecting the 68,000 locomotives in the United States, Congress placed that duty upon the carriers and made them responsible for the inspection, the repair, and the condition of their locomotives, and the duties of the federal inspectors largely supervisory. To this end, section 6 of the law provides that the first duty of

*From a paper read before the St. Louis Railway Club by Frank McManamy, chief inspector, Division of Locomotive Inspection, Interstate Commerce Commission.

the federal inspector shall be to see that the carriers make inspections in accordance with the rules and regulations established or approved by the Interstate Commerce Commission, and that carriers repair the defects which such inspections disclose before the locomotive or appurtenances pertaining thereto are again put in service. It further provides in cases where these duties are not performed by the carrier that the inspector shall issue a written order withholding the locomotive in question from service until the requirements are complied with.

In this the locomotive inspection laws differ from other laws governing the condition of railroad equipment; therefore, the method of enforcement has necessarily been worked out along somewhat different lines.

The locomotive inspection law is comparatively new and is so comprehensive that explanations will, no doubt, be of substantial value in assisting carriers to meet the requirements. First, I shall make clear one point with respect to which we are receiving numerous inquiries, and that is that the locomotive inspection law and rules in no way affect or change any of the requirements of the locomotive boiler inspection law or rules. It is true that the form of reports for monthly and annual inspections were changed somewhat, a combination form covering the entire locomotive, including the boiler, having been adopted. This was done to avoid the necessity of requiring additional sworn reports and not for the purpose of modifying in any way the boiler inspection requirements.

Rule No. 104 was intended to accomplish the general purpose of the act that carriers shall "make inspection in accordance with the rules and regulations established or approved by the Interstate Commerce Commission and that carriers repair the defects which such inspections disclose before the boiler or boilers or appurtenances pertaining thereto are again put in service," and in connection with rule 102 to definitely place the responsibility for failure to make inspections and repairs. It was also intended to, and if properly observed does, protect the foreman or other officer in charge of the mechanical department who is responsible for the condition of locomotives from pressure which in many instances they are unable to withstand to send out defective locomotives in an effort to avoid terminal delays. No railroad man can truthfully claim that in the long run there is economy of either time or money in using defective equipment and if delays due to defects are to occur it should be at terminals where repairs can be made without blocking the main line thereby.

It should be borne in mind that Government rules are not stop standards, or intended to represent the general condition of equipment, but are minimum requirements, or limits which mark the point at which the Government will take action to bring about necessary improvement in the condition of equipment. In other words, they represent the extreme condition in which the locomotive will be permitted to continue in service.

Form No. 2, which is required by rule No. 104, was intended to accomplish two definite purposes: First, to show that an inspection of each locomotive was made at the prescribed periods. Second, to require the foreman or officer in charge to know the condition of the locomotive, and to say why defects reported were not repaired before the locomotive is returned to service.

One of the reasons for this is that in many cases it is practically impossible when an accident resulting from defective equipment occurs to fix the responsibility for the defects in question. The officers in charge of the work will often insist that the defect was not properly reported, or not reported at all, and therefore, that they should not be held responsible for failure to make repairs. The person whose duty it was to report such defects insists with equal vigor that the defect was properly reported; perhaps had been reported numerous times, but had not been repaired. Failure to find the reports of a defect after an accident has occurred does not always indicate that such reports were not made, because frequently carbon or other copies of such reports are obtainable when the original reports cannot be found. These inspection reports must be kept on file in the offices of the railroad company, where they can be inspected.

One of our chief difficulties is getting form No. 2 approved by the foreman, "with proper written explanation made thereon for defects reported which were not repaired before the locomotive is returned to service," as required by the rule. We expected some difficulties in getting the inspections properly made, even though the rule differs but little, if any, from rules which were supposed to be in general use, but we did not expect that it would be more difficult to get the foreman to perform his part of the work than it would be to get proper inspections made, and any foreman who disregards the rules himself can never hope to bring about a proper observance on the part of his subordinates.

A few illustrations of what we find when making accident or other investigations will perhaps be of interest, and will show why we are insisting on a reasonable compliance with rule 104 by the foreman. We were advised that an engineman had been seriously injured by the failure of a knuckle pin in the left side rod. Investigation brought out the fact that the defective condition of rods and boxes, which in all probability caused the failure, had been reported on every trip for more than a month, but the repairs had not been made, neither had the foreman made any notation on the reports showing why. Driver brakes were inoperative, and the defects had been properly reported seven consecutive trips. Other defective conditions had been reported for varying periods, ranging from 10 to 34 days. Of course, I realize that under the circumstances it might be embarrassing to the foreman to put on paper his excuse (there could be no reason) for failing to make repairs.

In another instance we found it necessary to order a passenger locomotive out of service on account of steam leaking from a cracked cylinder seriously obscuring the enginemen's vision. An investigation showed that this defect had been reported at each end of the division for 30 consecutive days.

Another important duty which the law places on the Federal inspector is the investigation of all accidents resulting from failure from any cause of the locomotive or any of its appurtenances resulting in serious injury or death to one or more persons.

The question has frequently been asked, "What is a serious injury?" We have been following in this the rule long established by the Interstate Commerce Commission that injury which causes the loss of three or more days' time within 10 days immediately following the accident is serious and should be reported. As a matter of fact, every accident is serious and should be investigated, because in most instances the number injured, or the extent of their injuries, is governed by circumstances. Every accident is an indication that something is wrong, either in the condition of equipment or in methods of operation, and whether any one was injured at all should not be the determining factor as to whether an investigation should be made to find the cause and remedy the improper condition which may have existed; for instance, crown sheet failures, arch tube failures, flue failures, or, in fact, any failure of a locomotive may occur without resulting in injury, yet the cause is just as surely present as though serious or fatal injuries had resulted therefrom, and just as diligent efforts should be made to locate and remove it.

One of the principal reasons why the locomotive boiler inspection law had such remarkable success in reducing accidents was because it requires all accidents to be investigated and does not confine its work to only spectacular accidents which cause a great loss of life or which are un-

usual. Such accidents when they occur are given wide publicity and are usually very thoroughly investigated by both Federal and State authorities and active steps are taken to prevent a recurrence, for a time at least.

By far the greater percentage of killed and injured in railroad service is due to accidents of a character which are never brought to the attention of the general public because they are considered as a part of the day's work of railroad employees. In the regular course of his employment an engineman may be scalded or otherwise injured, a trainman may lose a finger, a hand or a foot, and none except his immediate family and co-employees are aware of the occurrence, yet to the person injured and to his family the injury is just as serious as though it had resulted from a spectacular accident which would receive columns of newspaper comment. These are the accidents which swell the list of killed and injured, and an investigation of each one of them to correct whatever may be wrong with the equipment or with the methods either of the man or the company will do more to reduce the accident list than special investigations of spectacular accidents, which, after all, may be traced back to some minor cause.

To illustrate: An accident which resulted in the death of six persons, serious injury to ten and caused a property damage estimated at $15,000, was caused by failure to properly hook up the steam heat hose at the rear of the tender.

In another case of record where a serious accident is directly traceable to a minor defect, a local passenger train was stopped between stations by the failure of the pipe leading from the main reservoir to the air signal whistle. Before the pipe could be repaired and the brakes released or the flagman could get back far enough to protect the train, it was struck by a through train which was following, killing 11 and injuring 10 persons. While in this instance the flagging was not above criticism, the first step in the sequence of events leading up to the accident was the failure of the signal pipe which had been reported the previous night, but had not been repaired.

Accidents almost without number which result from similar minor causes might be cited, but this is sufficient to establish the point and to impress upon all the importance of giving attention to details and remedying all minor defects before serious results follow.

AN EARLY RAILWAY LOCATION

The main line of the Seaboard Air Line extending south from Portsmouth, Va., includes some of the oldest railway projects in this country. A report was recently found relative to the location of one of these properties, the Portsmouth & Roanoke Railroad, which was made previous to 1840 by Walter Gwynn, and which contains a number of interesting comparisons with present day construction and operating standards. We are indebted to W. D. Faucette, chief engineer of the Seaboard Air Line for a copy of this report which is abstracted below.

The length of the line is 77 miles, being only half a mile longer than the distance on a direct line between Portsmouth and Weldon. The greatest inclination does not exceed 20 ft. to the mile. Throughout the whole extent of the road there are few deviations from a straight line, and these are effected on the arcs of circles whose radii are in no instance less than 5,730 ft., and are most generally 11,460 ft. in length. Gentle inclinations and easy curvatures (when it is necessary to vary from a straight line) are points of essential importance on the location of railroads; these desirable objects as well as a line extensively favorable to the advantageous employment of locomotive engines are here attained.

Indeed, considering the straightness and the moderate ascents and descents, the performance of an engine (given power) will be greater on this than on any other railroad now constructed in the United States. We are therefore enabled to use light engines, thereby diminishing very considerably the great and leading items in the expense of transportation on railroads, viz. wear and tear and repairs.

The engine which it is proposed to use will not exceed five tons weight, and its performance on this road will be equal to that of a six ton engine on a road with 30 ft. grades. From this general view it will be seen that the face of the country is eminently suitable to the proposed work. The intervening swamps and the alluvial bottoms of the Nottoway Blackwater and Meherrin offer no obstacles. The bottom is everywhere composed of solid materials, affording a firm foundation for any embankment or other structure it may be necessary to place on it.

It will not be necessary on the present occasion to discuss the relative merits of the various modes of construction and the variety of materials which have been used in the formation of railways. Suffice it to say that almost universal substitution of wood for stone, and the iron-edge rail, establishes its performance in the first instance even where stone is abundant and timber scarce. Among many reasons for this preference of wood are its elasticity, its sufficient stability, and its diminution of the wear and tear of engines and cars. It follows then as a necessary consequence, that I recommend for your railroad the use of timber, which is found in abundance, of excellent quality on almost every part of the line.

The superstructure, which I propose to adopt, will be heart pine rails, 9 by 5 in., plated with iron bars 2 in. wide and ½ in. thick, resting on white or post oak sills 10 by 12 in., and 8 ft. long, placed across the road 5 ft. apart from center to center.

The rails will be placed parallel to each other 4 ft. 8½ in. apart, let into the sills and properly secured by white oak wedges. The sills will be notched for the reception of the rails and wedges and hollowed out in the middle so as to admit of the construction of a path over them which will add considerable stiffness to the road at a very moderate expense, and adapt it to the use of either horse or locomotive power, or both.

I have estimated for a single railway, which for the present will afford sufficient accommodation to the trade and travel. The ditches, however, will be cut and the waste earth disposed with view to a double track, whenever it may be deemed necessary. The graduated surface of the road bed in excavations will vary from 18 to 16 ft. in width, the slopes being 45 deg. The graded surface on embankments will present a uniform width of 12½ ft., with side slopes of 33 1/3 deg. or 1½ base to 1 perpendicular.

RAILROADS DO UNCLE SAM'S ADVERTISING.—Uncle Sam as a real-estate agent presents a prospect regarding which any advertising agent might be tempted to grow enthusiastic, and yet, to date, the government has depended almost wholly upon charity for its real-estate advertising. The government has land for sale in the west, has camp sites for lease in the national forests, has or will have, for negotiation water-power rights, oil-land leases and coal leases, and yet it proclaims these offerings in the same feeble manner that it exploits its sales of valuable furs. Save for such ammunition as the illustrated booklets issued by the United States Reclamation Service the government has been wont to depend for its real-estate advertising almost solely upon the railroads, just as it is left to the railroads to advertise by means of their "See America First" campaigns the public playgrounds from which Uncle Sam can profit through hotel leases, etc.—*Printers' Ink.*

General News Department

The Buffalo, Rochester & Pittsburgh has offered to permit employees to cultivate portions of the unoccupied land along its right of way; and, to help the movement get a start, the company has offered to furnish seed potatoes free.

The meeting of the western division of the Association of Railway Telegraph Superintendents, scheduled for March 21 in Chicago, but postponed on account of the threatened trainmen's strike, will take place at La Salle hotel, Chicago, April 18.

The Oregon Short Line will send 100 men in its employ to the military training camp at Ft. Douglas, Utah, for a 30-days' training period beginning August 4. The men will be maintained on the company's payroll at full salary during their service in camp.

The shops of the Pullman Company, Pullman, Ill., have just completed a "service car" for the Department of Public Health of the United States government. The car is to be used by chemists who are to travel around the country to analyze drinking water supplied to passengers by the railroads.

The Boston & Albany has made an advance of 5 per cent in the pay of all classes of employees who are not subject to the Adamson law, excepting those receiving $150 or more monthly. It is estimated that this will increase the annual payrolls about $250,000. The New York, New Haven & Hartford has advanced the wages of laborers, including track repairmen, 10 per cent.

The semi-annual loss and damage claim conference of the Santa Fe system was held last week in Galveston, Tex. More than a hundred representatives from all parts of the system participated in the meeting, which lasted four days. F. A. Lehman, assistant to the vice-president in charge of operation of the Atchison, Topeko & Santa Fe at Chicago, presided over the sessions.

In the yards of the Philadelphia & Reading in the anthracite region the switchmen are to be worked henceforth only eight hours a day; and large numbers of new men will have to be employed. According to local newspapers numbers of clerks, telegraphers and other employees of the road are resigning their places to take positions in the train service, where the pay is very much higher than in their present jobs.

John J. Dempsey, superintendent of transportation of the New York Consolidated Railroad, has been fined $500 in the county court at Brooklyn, N. Y., for violation of an order of the State Public Service Commission, First District, in running certain elevated railroad trains past a given station without stopping; and on the Public Service Commission's learning that the fine had been paid by the railroad company and charged to operating expenses, it sent a notice to the railroad company declaring that the inclusion of this item in expenses would be regarded as unreasonable and improper.

B. P. Jones, owner of the Valdosta, Moultrie & Western Railway, who is now upward of 80 years old, has expressed the intention of giving the railroad to his sons; but before doing so he has presented to the Valdosta Chamber of Commerce 200 shares of the capital stock of the road; and, in response to his request, the chamber has chosen three of its members to be directors of the railway company. This road extends from Valdosta, Ga., northwestward 42 miles to Moultrie. One of its two trains each way has a sleeping car which runs through between Atlanta, Ga., and Hampton Springs, Fla.

Out of 1,200 maintenance of way employees of the Chicago & Alton, who were scheduled to strike on March 28, about 200 actually quit work. Announcement of the strike order had been made by R. E. Clodfelter, grand organizer of the union who stated the demands of the men as an increase of $10 a month for foremen and assistant foremen, a 12½ per cent increase for employees in bridge and water service and an advance of from 19 to 22½ cents an hour for track laborers. According to reports from Alton on April 4 the strikers had returned to work at the old wages.

The E. H. Harriman Memorial Medal, awarded for excellence in promoting safety, has been given, for the year 1916, to the Alabama Great Southern Railway Company. During the year not a single passenger or employee was killed in a train accident on that road, and there was only one fatal accident from any cause. A silver replica of the medal was given to the Illinois division of the Illinois Central. A bronze replica, granted yearly to the individual who has been most conspicuous in the promotion of safety and health, is awarded, for 1916, to James A. McCrea, general manager of the Long Island Railroad, for his publicity campaign and other activities in connection with safety at highway grade crossings.

Ralph Peters, president of the Long Island Railroad, has written a letter to employees of the road, pointing out that, in case of war, their duty to the country will require them to stay in their places. In the event of war the railroads will be essential to national defense, and it would be a calamity for them not to be well organized and completely manned. The letter expressed the expectation of being able to increase the pay of employees within a short time. The appeal is intended not only for men who might feel it a duty to enlist in the ranks, including those who might do so in order not to be classed as "slackers," but also to the man who is tempted to accept a better paying job in the manufacture of war supplies.

Students of transportation of the University of Illinois, in charge of Professor E. R. Dewsnup, spent April 2 to 5, inclusive, visiting various departments of railroads in Chicago. Their itinerary included an inspection of the Chicago & North Western passenger terminal, a trip to the Proviso (Chicago) yards of the North Western, and visits to the Burnside (Chicago) shops of the Illinois Central, the offices of the general superintendent, the general superintendent of transportation, the auditor of disbursements, and the general storekeeper of the same road. Various departments of the Chicago, Rock Island & Pacific, the Chicago & Eastern Illinois and the Chicago, Burlington & Quincy were also visited. Some of the railroad officers gave instructive talks to the students concerning the departments over which they have jurisdiction.

The Long Island Railroad is to electrify its Evergreen branch in Brooklyn and Queens boroughs, New York City. This electrification, covering about 1½ miles, is desired by the State Public Service Commission because of the proposed use of the right of way for an elevated railroad. The city, through the commission, is going to take an easement over the Evergreen right of way for the erection of a portion of the Fourteenth Street-Eastern elevated line. The Long Island has asked of the commission that the proposed easement deed between the commission and the railroad company provide that the use of electricity by the railroad company shall not be compulsory until two years after the completion of the rapid transit line. The company, however, recognizes that the use of coal locomotives would produce a great deal of smoke that would be unpleasant to passengers on the elevated trains, and has promised, therefore, to hasten the work, although asking that the temporary use of steam locomotives be permitted.

Popularity of Railroads Growing

According to a press despatch from Lorain, Ohio, the New York, Chicago & St. Louis Railroad is the cause of a conflict between Avon Lake township, Lorain county, and Avon township adjoining, not because of its transportation advantages, but because it yields an appreciable amount of taxes. The trustees of Avon township recently gave notice that an election would be held to determine whether the township should be made an incorporated village and whether its north line should be extended 60 ft. to take in the Nickel Plate right-of-way. The election was scheduled to be held on April 5. Avon Lake township followed its rival with a notice that it also would hold an incorporation election on April 5, and that it proposed also to include the same

stretch of the railroad within its confines. The township's southern line is the southerly line of the railroad property. From all reports incorporation will win in both townships and the matter will find its way into the courts.

Weighing of Mails

All mails carried by railroads are now being weighed throughout the country. Beginning on March 27, and for a period of 35 days, the weight is being taken of all mails which are carried under the space-rate system as put in effect last November; and on the closed pouch routes, where the space rate has not been put in use, the weighing is to be continued for 105 days.

Pensions on the Norfolk & Western

The Norfolk & Western Railway announces that a relief and pension department will be put in operation on that road July 1 next. All officers and employees will be retired at the age of 70; and, under certain conditions, at ages 65 to 69 inclusive. The basis of the pension allowance will be 1 per cent of the average salary of the employee for the ten years next preceding retirement, multiplied by the number of years that he has served. For example, an employee who has received $1,000 a year, and who has been in the service 40 years, will receive $400 a year.

Rents Right of Way for Garden Purposes

The St. Louis-San Francisco has granted permission to the general public, and to its employees as well, to make use of unoccupied tracts on its right of way for agricultural purposes, charging therefor a nominal fee of $1, which is necessary to make the transaction legal. The Frisco and its subsidiary companies operate 5,254 miles of line, the right of way for which varies from 50 to 200 ft. in width. A considerable portion of this can be cultivated. Applicants are required to call on the station agents who forward the information for the preparation of a lease to the superintendent.

Bureau Report on Black Tom Explosion

Colonel B. W. Dunn, chief inspector of the Bureau of Explosives, New York City, has issued an elaborate report of his investigation of the disastrous explosion in the yard of the Lehigh Valley Railroad at Black Tom, New York harbor, July 30, 1916, when over 500,000 lb. of trinitrotoluol and picric acid was destroyed, involving a loss of two lives and many millions of dollars' worth of property. About 220 freight cars were destroyed. Colonel Dunn believes that all of the known facts justify the assumption that this catastrophe was due to a fire started by an incendiary. The most important lesson taught by the disaster, in his opinion, is the same as that taught by the explosions at Communipaw, N. J., in February, 1911, and at Baltimore in March, 1913, namely, that the Federal government should regulate the transportation of explosives on water the same as it now does on land. The uniform regulations prepared by the Bureau of Explosives, and adopted by the government, have greatly reduced the dangers from the transportation of explosives by railroad, and it is reasonable to expect that a similar improvement could be made in transportation by water.

The Canadian Industrial Disputes Act

The Canadian Industrial Disputes Act, advocated by President Wilson as a basis for legislation in this country, has been investigated by the Russell Sage Foundation, as reported in the Survey of March 31. The conclusion is that the act has operated not as compulsory investigation, but as a voluntary conciliation measure. The compulsory features of the act, which impose a penalty for violation, and the definite rules of procedure have not been emphasized in its administration. Altogether approximately 84 strikes on public utilities may be charged as illegal. The records of the Canadian Department of Labor for the same period show only eight prosecutions, and these were relatively unimportant.

The particular problem for which the act was devised was industrial unrest in coal mines. Since its enactment, however, strikes in the coal mines have been more numerous than before.

A majority of Canadian trade unionists are opposed to the act, but these objectors do not advance the argument heard in this country against President Wilson's measure—that such a law means compulsory servitude for the wage-earners. On the contrary, most of them approve of the principle of the law, and direct their criticism purely against administrative defects. The investigator's recommendation for the United States is that the government ought to establish machinery both for the continuous collection of all the facts available on labor controversies, and for an inquiry into the merits of particular disputes.

Pacific Railway Club

The Pacific Railway Club was organized in San Francisco, Cal., on March 1. The club was formed after a letter ballot had been taken of all railway officers in the cities about San Francisco bay to determine whether there was a general need of a forum where matters relating to railway construction, operation and maintenance might be presented and discussed. As the ballot was preponderantly in favor of such an organization a meeting was held to effect its formation, and 86 charter members, including employees of 10 railroads and the professors of railroad engineering and economics of the University of California and Leland Stanford University, were taken in. The officers elected for the club's first year are: President, A. H. Babcock, consulting electrical engineer, Southern Pacific; first vice-president, G. H. Binkley, valuation engineer, United Railways of San Francisco; second vice-president, P. P. Hastings, assistant general freight agent, Atchison, Topeka & Santa Fe; treasurer, B. W. Perrin, division engineer, suburban lines, Southern Pacific; secretary, W. S. Wollner, assistant to the chief engineer, Northwestern Pacific. In addition to the officers the board of governors includes R. H. Ingram, general manager, Mount Tamalpais & Muir Woods railroad; W. R. Alberger, vice-president and general manager, San Francisco-Oakland Terminal Railways; R. L. Lowry, superintendent of roadway, Oakland, Antioch & Eastern, and G. W. Rear, general bridge inspector, Southern Pacific.

Membership is limited to persons active in railroad work, or to those employed by railroad regulatory bodies, or on the faculty of a college of recognized standing. Junior membership has been provided for persons under 21 years of age who are actively employed in railroad work or are students of railroad subjects in colleges of recognized standing.

The club will hold a meeting on April 12 to consider the subject, "The Railways' Part in Military Preparedness." The railroad aspect of this subject is to be presented by A. H. Babcock, member of the United States Navy Consulting Board, and the military aspect by Lieut.-Col. B. F. Cheatham, Quartermaster Corps, United States army. G. S. Waid, vice-president and general manager of the Galveston, Harrisburg & San Antonio Railway, will read a paper on "Moving Troops on the Mexican Border."

Organization of Gear Manufacturers

An organization of gear manufacturers was formed at Lakewood, N. J., at a meeting held there March 25 and 27.

This organization will be known as the American Gear Manufacturers' Association. Its purposes are to advance and improve the gear industry in a general way by standardization of gear design, manufacture and application. This association includes in its membership the foremost and better-known manufacturers of gears.

The executive committee is composed of the following: F. W. Sinram, Van Dorn & Dutton Company, Cleveland, Ohio; H. E. Eberhardt, Newark Gear Cutting Machine Company, Newark, N. J.; F. D. Hamlin, Earle Gear & Machine Company, Philadelphia, Pa.; Frank Horsburgh, Horsburgh & Scott, Cleveland, Ohio; Biddle Arthur, Simonds Manufacturing Company, Pittsburgh, Pa.; George L. Markland, Philadelphia Gear Works, Philadelphia, Pa.; Milton Rupert, R. D. Nuttall Company, Pittsburgh, Pa.

The officers elected at the Lakewood meeting are as follows: President, F. W. Sinram; vice-president, H. E. Eberhardt; secretary, F. D. Hamlin, and treasurer, Frank Horsburgh.

The next meeting of the association will be held at Pittsburgh, May 14 and 15.

New England Railroad Club

At the next regular meeting of the New England Railroad Club to be held at the Hotel Brunswick, Boston, April 10, a paper will be read on "Stephenson and Transportation," by F. E. Stanley, of the Stanley Motor Carriage Company.

Association of General Baggage Agents

The American Association of General Baggage Agents held its thirty-sixth annual convention at Los Angeles, Cal., March 21, 22 and 23. J. B. Calkins, general baggage agent of the Cleveland, Cincinnati, Chicago & St. Louis, at Cleveland, Ohio, was elected president of the association to succeed W. H. Kellond. W. D. Carrick, general baggage agent of the Chicago, Milwaukee & St. Paul, Milwaukee, Wis., was elected vice-president, succeeding J. B. Calkins. J. E. Quick, general baggage agent of the Grand Trunk at Toronto, Ont., was re-elected secretary-treasurer.

MEETINGS AND CONVENTIONS

The following list gives names of secretaries, dates of next or regular meetings and places of meetings:

AIR BRAKE ASSOCIATION.—F. M. Nellis, Room 3014, 165 Broadway, New York City. Next annual convention, May 1-4, 1917, Hotel Chisca, Memphis, Tenn.

AMERICAN ASSOCIATION OF DEMURRAGE OFFICERS.—F. A. Pontious, 455 Grand Central Station, Chicago. Next meeting, July 18, 1917, Asheville, N. C.

AMERICAN ASSOCIATION OF DINING CAR SUPERINTENDENTS.—H. C. Boardman, D. L. & W., Hoboken, N. J. Next convention, October, 1917, San Francisco, Cal.

AMERICAN ASSOCIATION OF FREIGHT AGENTS.—R. O. Wells, Illinois Central, Chicago, Ill. Next meeting, June, 1917, Denver.

AMERICAN ASSOCIATION OF PASSENGER TRAFFIC OFFICERS.—W. C. Hope, C. R. R. of N. J., 143 Liberty St., New York.

AMERICAN ASSOCIATION OF RAILROAD SUPERINTENDENTS.—E. H. Harman, Room 101, Union Station, St. Louis, Mo. Annual meeting, August 8-10, 1917, Minneapolis, Minn.

AMERICAN ELECTRIC RAILWAY ASSOCIATION.—E. B. Burritt, 8 W. 40th St., New York.

AMERICAN ELECTRIC RAILWAY MANUFACTURERS' ASSOCIATION.—Fred C. J. Dell, 165 Broadway, New York.

AMERICAN RAILROAD MASTER TINNERS', COPPERSMITHS' AND PIPEFITTERS' ASSOCIATION.—W. E. Jones, C. & N. W., 3814 Fulton St., Chicago.

AMERICAN RAILWAY ASSOCIATION.—J. E. Fairbanks, general secretary, 75 Church St., New York.

AMERICAN RAILWAY BRIDGE AND BUILDING ASSOCIATION.—C. A. Lichty, C. & N. W., Chicago. Next convention, October 16-18, 1917, St. Paul, Minn.

AMERICAN RAILWAY ENGINEERING ASSOCIATION.—E. H. Fritch, 900 S. Michigan Ave., Chicago.

AMERICAN RAILWAY MASTER MECHANICS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June 13-20, 1917, Atlantic City, N. J.

AMERICAN RAILWAY TOOL FOREMEN'S ASSOCIATION.—Owen D. Kinsey, Illinois Central, Chicago. Next convention, August 30-September 1, Hotel Sherman, Chicago.

AMERICAN SOCIETY FOR TESTING MATERIALS.—Prof. E. Marburg, University of Pennsylvania, Philadelphia, Pa.

AMERICAN SOCIETY OF CIVIL ENGINEERS.—Chas. Warren Hunt, 220 W. 57th St., New York. Regular meetings, 1st and 3d Wednesday in month, except July and August, 220 W. 57th St., New York.

AMERICAN SOCIETY OF MECHANICAL ENGINEERS.—Calvin W. Rice, 29 W. 39th St., New York. Next convention, May 21-24, 1917, Cincinnati, Ohio.

AMERICAN WOOD PRESERVERS' ASSOCIATION.—F. J. Angier, Supt. Timber Preservation, B. & O., Mt. Royal Sta., Baltimore, Md. Next convention, January, 1918, Chicago.

ASSOCIATION OF AMERICAN RAILWAY ACCOUNTING OFFICERS.—E. R. Woodson, Rooms 1116-8 Woodward Bldg., Washington, D. C. Annual meeting, May 30, 1917, Hotel Jefferson, Richmond, Va.

ASSOCIATION OF MANUFACTURERS OF CHILLED CAR WHEELS.—George W. Lyndon, 1214 McCormick Bldg., Chicago. Semi-annual meeting with Master Car Builders' Association.

ASSOCIATION OF RAILWAY CLAIM AGENTS.—Willis H. Failing, Terminal Station, Central of New Jersey, Jersey City, N. J. Next meeting, May, 1917, Cincinnati, Ohio.

ASSOCIATION OF RAILWAY ELECTRICAL ENGINEERS.—Jos. A. Andreucetti, C. & N. W., Room 411, C. & N. W. Sta., Chicago.

ASSOCIATION OF RAILWAY TELEGRAPH SUPERINTENDENTS.—W. L. Connelly, Superintendent of Telegraph, Indiana Harbor Belt, Gibson, Ind. Next annual meeting, September 18-20, 1917, Washington, D. C.

ASSOCIATION OF TRANSPORTATION AND CAR ACCOUNTING OFFICERS.—G. P. Conard, 75 Church St., New York.

BRIDGE AND BUILDING SUPPLY MEN'S ASSOCIATION.—Tom Lehon, The Lehon Company, Chicago. Meetings with American Railway Bridge and Building Association.

CANADIAN RAILWAY CLUB.—James Powell, Grand Trunk, P. O. Box 7, St. Lambert (near Montreal), Que. Regular meetings, 2d Tuesday in month, except June, July and August, Windsor Hotel, Montreal, Que.

CANADIAN SOCIETY OF CIVIL ENGINEERS.—Clement H. McLeod, 176 Mansfield St., Montreal, Que. Regular meetings, 1st Thursday in October, November, December, February, March and April. Annual meeting, January, Montreal.

CAR FOREMEN'S ASSOCIATION OF CHICAGO.—Aaron Kline, 841 Lawlor Ave., Chicago. Regular meetings, 2d Monday in month, except June, July and August, Hotel La Salle, Chicago.

CENTRAL RAILWAY CLUB.—H. D. Vought, 95 Liberty St., New York. Regular meetings, 2d Friday in January, May, September and November. Annual dinner, 2d Thursday in March, Hotel Statler, Buffalo, N. Y.

CHIEF INTERCHANGE CAR INSPECTORS' AND CAR FOREMEN'S ASSOCIATION.—W. R. McMunn, New York Central, Albany, N. Y. Next convention, September, 1917, St. Louis.

ENGINEERS' SOCIETY OF WESTERN PENNSYLVANIA.—Elmer K. Hiles, 2511 Oliver Bldg., Pittsburgh, Pa. Regular meetings, 1st and 3d Tuesday, Pittsburgh, Pa.

FREIGHT CLAIM ASSOCIATION.—Warren P. Taylor, Traffic Manager, R. F. & P., Richmond, Va. Annual convention, June 19, 1917, Chicago, Ill.

GENERAL SUPERINTENDENTS' ASSOCIATION OF CHICAGO.—A. M. Hunter, 321 Grand Central Station, Chicago. Regular meetings, Wednesday, preceding 3d Thursday in month, Room 1856, Transportation Bldg., Chicago.

INTERNATIONAL RAILROAD MASTER BLACKSMITHS' ASSOCIATION.—A. L. Woodworth, C. H. & D., Lima, Ohio. Next annual meeting, August 21-23, 1917, Chicago.

INTERNATIONAL RAILWAY FUEL ASSOCIATION.—J. G. Crawford, C. B. & Q. R. R., 702 E. 51st St., Chicago. Next meeting, May 14-17, 1917, Hotel Sherman, Chicago.

INTERNATIONAL RAILWAY GENERAL FOREMEN'S ASSOCIATION.—Wm. Hall, 1126 W. Broadway, Winona, Minn. Annual meeting, September 4-7, 1917, Hotel Sherman, Chicago.

MAINTENANCE OF WAY AND MASTER PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—F. W. Hager, Fort Worth & Denver City, Fort Worth, Tex. Next convention, October 16-18, 1917, Cleveland, Ohio.

MASTER BOILER MAKERS' ASSOCIATION.—Harry D. Vought, 95 Liberty St., New York. Annual convention, May 22-25, 1917, Hotel Jefferson, Richmond, Va.

MASTER CAR AND LOCOMOTIVE PAINTERS' ASSOCIATION OF THE UNITED STATES AND CANADA.—A. P. Dane, B. & M., Reading, Mass. Next annual meeting, September 11, 1917, Chicago.

MASTER CAR BUILDERS' ASSOCIATION.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Next meeting, June 13-20, 1917, Atlantic City, N. J.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS.—Wm. H. Connolly, 1319 Columbia Road, Washington, D. C. Next annual convention, October 16, 1917, Washington, D. C

NATIONAL RAILWAY APPLIANCES ASSOCIATION.—C. W. Kelly, 349 Peoples Gas Bldg., Chicago.

NEW ENGLAND RAILROAD CLUB.—W. E. Cade, Jr., 683 Atlantic Ave., Boston, Mass. Regular meeting, 2d Tuesday in month, except June, July, August and September, Boston.

NEW YORK RAILROAD CLUB.—Harry D. Vought, 95 Liberty St., New York. Regular meeting, 3d Friday in month, except June, July and August, 29 W. 39th St., New York.

NIAGARA FRONTIER CAR MEN'S ASSOCIATION.—Geo. A. J. Hochgrebe, 623 Brisbane Bldg., Buffalo, N. Y. Meetings 3d Wednesday in month, New York Telephone Bldg., Buffalo, N. Y.

PEORIA ASSOCIATION OF RAILROAD OFFICERS.—F. C. Stewart, 410 Masonic Temple Bldg., Peoria, Ill. Regular meetings, 3d Thursday in month, Jefferson Hotel, Peoria.

RAILROAD CLUB OF KANSAS CITY.—Claude Manlove, 1008 Walnut St., Kansas City, Mo. Regular meetings, 3d Saturday in month, Kansas City.

RAILWAY BUSINESS ASSOCIATION.—Frank W. Noxon, 30 Church St., New York.

RAILWAY CLUB OF PITTSBURGH.—J. B. Anderson, Room 207, P. R. R. Sta., Pittsburgh, Pa. Regular meetings, 4th Friday in month, except June, July and August, Pittsburgh Commercial Club Rooms, Colonial-Annex Hotel, Pittsburgh.

RAILWAY DEVELOPMENT ASSOCIATION.—D. C. Welty, Commissioner of Agriculture, St. L., Iron Mt. & So., 1047 Railway Exchange Bldg., St. Louis. Annual meeting, May 9-11, 1917, Louisville, Ky.

RAILWAY ELECTRICAL SUPPLY MAUNFACTURERS' ASSOCIATION.—J. Scribner, 1063 Monadnock Block, Chicago. Meetings with Association of Railway Electrical Engineers.

RAILWAY FIRE PROTECTION ASSOCIATION.—C. B. Edwards, Office of the President's Assistant, Seaboard Air Line, Norfolk, Va. Next meeting, October 2-4, 1917, St. Louis, Mo.

RAILWAY REAL ESTATE ASSOCIATION.—R. H. Morrison, Assistant Engineer, C. & O., Richmond, Va. Next convention, October, 1917, Duluth, Minn.

RAILWAY SIGNAL ASSOCIATION.—C. C. Rosenberg, Myers Bldg., Bethlehem, Pa. Next meeting, June, 1917, Hotel McAlpin, N. Y. Next annual convention, September, 1917, Atlantic City, N. J.

RAILWAY STOREKEEPERS' ASSOCIATION.—J. P. Murphy, N. Y. C. R. R., Box C., Collinwood, Ohio. Annual convention, May 21-23, 1917, Chicago.

RAILWAY SUPPLY MANUFACTURERS' ASSOCIATION.—J. D. Conway, 2136 Oliver Bldg., Pittsburgh, Pa. Meetings with Master Car Builders' and Master Mechanics' Association.

RAILWAY TELEGRAPH AND TELEPHONE APPLIANCE ASSOCIATION.—G. A. Nelson, 50 Church St., New York. Meetings with Association of Railway Telegraph Superintendents.

RICHMOND RAILROAD CLUB.—F. O. Robinson, C. & O., Richmond, Va. Regular meetings, 2d Monday in month, except June, July and August.

ROADMASTERS' AND MAINTENANCE OF WAY ASSOCIATION.—P. J. McAndrews, C. & N. W., Sterling, Ill. Next annual convention, September 18-21, 1917, Hotel Auditorium, Chicago.

ST. LOUIS RAILWAY CLUB.—B. W. Frauenthal, Union Station, St. Louis Mo. Regular meetings, 2d Friday in month, except June, July and August, St. Louis.

SALT LAKE TRANSPORTATION CLUB.—R. E. Rowland, David Keith Bldg., Salt Lake City, Utah. Regular meetings, 1st Saturday of each month, Salt Lake City.

SIGNAL APPLIANCE ASSOCIATION.—F. W. Edmunds, 3868 Park Ave., New York. Meetings with annual convention Railway Signal Association.

SOCIETY OF RAILWAY FINANCIAL OFFICERS.—L. W. Cox, N. & W., Philadelphia, Pa.

SOUTHERN ASSOCIATION OF CAR SERVICE OFFICERS.—E. W. Sandwich, A. & W. P. R. R., Atlanta, Ga.

SOUTHERN & SOUTHWESTERN RAILWAY CLUB.—A. J. Merrill, Grant Bldg., Atlanta, Ga. Regular meetings, 3d Thursday, January, March, May, July, September, November, 10 a. m., Piedmont Hotel, Atlanta.

TOLEDO TRANSPORTATION CLUB.—Harry S. Fox, Toledo, Ohio. Regular meetings, 1st Saturday in month, Boody House, Toledo.

TRACK SUPPLY ASSOCIATION.—W. C. Kidd, Ramapo Iron Works, Hillburn, N. Y. Meetings with Roadmasters' and Maintenance of Way Association.

TRAFFIC CLUB OF CHICAGO.—W. H. Wharton, La Salle Hotel, Chicago.

TRAIN DESPATCHERS' ASSOCIATION OF AMERICA.—J. F. Mackie, 7122 Stewart Ave., Chicago. Next meeting, June 19, 1917, Fresno, Cal.

TRANSPORTATION CLUB OF DETROIT.—W. R. Hurley, Superintendent's office, N. Y. C. R. R., Detroit, Mich. Meetings monthly, Normandie Hotel, Detroit.

TRAVELING ENGINEERS' ASSOCIATION.—W. O. Thompson, N. Y. C. R. R., Cleveland, Ohio. Next convention, September, 1917, Chicago.

WESTERN ASSOCIATION OF SHORT LINE RAILROADS.—Clarence M. Oddie, Mills Bldg., San Francisco.

WESTERN CANADA RAILWAY CLUB.—L. Kon, Immigration Agent, Grand Trunk Pacific, Winnipeg, Man. Regular meetings, 2d Monday, except June, July and August, Winnipeg.

WESTERN RAILWAY CLUB.—J. W. Taylor, 1112 Karpen Bldg., Chicago. Regular meetings, 3d Monday in month, except June, July and August, Hotel Sherman, Chicago.

REVENUES AND EXPENSES OF RAILWAYS

MONTH OF FEBRUARY, 1917

Name of road.	Average mileage operated during period.	Operating revenues			Operating expenses							Net from railway operation.	Railway tax accruals.	Operating income (or loss).	Increase (or decr.) comp. with last year.
					Maintenance of										
		Freight.	Passenger.	Total (inc. misc.)	Way and structures.	Equipment.	Traffic.	Transportation.	Miscellaneous.	General.	Total.				
Arizona Eastern	378	$321,555	$50,989	$394,784	$35,564	$33,918	$2,799	$78,710	$4,301	$13,783	$168,906	$225,878	$16,092	$209,772	$136,751
Atchison, Topeka & Santa Fe	8,648	6,794,799	2,349,373	9,931,330	925,806	1,673,292	171,987	3,094,736	58,463	197,635	6,101,401	3,829,929	506,846	3,321,995	387,683
Atlanta & West Point	93	60,089	46,332	124,062	13,632	20,582	7,116	38,491	3,029	4,751	87,603	36,459	7,195	29,253	7,744
Atlantic & St. Lawrence	167	151,169	19,687	188,395	22,924	25,932	4,281	120,943	.....	7,348	181,428	6,967	10,721	—3,754	—29,543
Atlantic Coast Line	4,775	2,362,280	1,094,401	3,790,315	395,779	497,266	66,333	1,124,615	21,892	81,935	2,186,509	1,603,807	183,000	1,420,675	219,047
Baltimore & Ohio Chicago Terminal	79	.....	428	128,009	11,798	23,997	1,114	112,755	1,297	6,434	156,564	—28,556	22,689	—51,479	—56,547
Baltimore, Chesapeake & Atlantic	88	18,670	6,054	26,614	7,756	10,339	1,827	32,336	.....	2,360	54,619	—28,005	2,291	—30,296	—25,436
Belt Ry. Co. of Chicago	31	.....	.....	244,390	17,037	36,207	1,384	143,988	.....	6,900	205,517	38,874	13,898	24,976	—34,254
Bessemer & Lake Erie	205	432,753	22,287	473,414	47,527	222,017	9,428	185,377	.....	14,846	470,666	2,748	18,866	—16,121	—72,483
Boston & Maine	2,306	2,414,180	1,132,214	4,001,884	456,966	644,446	26,565	2,343,919	20,365	95,890	3,588,150	413,734	171,085	242,648	—642,045
Buffalo & Susquehanna R. R. Corporation	253	113,536	5,584	121,421	18,359	35,519	1,372	38,516	.....	5,974	99,741	21,680	2,600	19,080	—27,720
Buffalo, Rochester & Pittsburgh	586	755,999	85,399	870,450	74,963	219,554	15,229	369,076	1,252	26,495	706,568	163,882	25,000	138,882	—118,117
Carolina, Clinchfield & Ohio	283	249,196	18,175	274,176	24,694	48,545	17,082	67,217	.....	12,637	169,699	104,477	13,400	91,071	—19,525
Carolina, Clinchfield & Ohio of S. C.	18	13,488	1,153	15,219	1,330	98	2,138	2,788	.....	580	6,934	8,286	600	7,682	—738
Charleston & Western Carolina	342	131,617	26,053	165,862	31,505	25,513	4,490	60,280	.....	4,576	126,267	39,596	6,500	33,096	—15,347
Chicago & Alton	1,053	975,507	295,119	1,376,715	145,126	265,867	36,090	518,179	9,838	31,520	1,006,233	370,481	54,350	315,586	—32,210
Chicago & North Western	8,108	4,360,369	1,497,659	6,683,242	722,514	1,344,228	114,493	3,130,823	56,247	201,888	5,562,099	1,121,143	425,000	695,611	—1,086,946
Chicago, Detroit & Can. Grand Trk. Jctn.	60	57,167	16,861	96,611	4,471	15,014	1,533	52,293	.....	1,627	74,938	21,673	3,546	18,113	—3,961
Chicago Great Western	1,496	753,555	243,875	1,097,805	131,047	192,929	42,456	496,934	11,155	37,725	910,863	186,942	51,000	134,781	—197,906
Chicago Junction	13	.....	.....	201,903	23,309	23,438	1,087	167,675	.....	5,295	220,804	—18,901	2,105	—21,007	—43,686
Chicago, Peoria & St. Louis	255	134,891	19,075	161,536	17,843	26,476	6,340	75,047	.....	5,678	131,384	30,152	6,000	24,152	5,715
Chicago, Rock Island & Gulf	477	206,395	66,288	293,997	43,689	48,314	9,953	96,495	1,333	8,720	208,504	85,493	10,000	75,493	16,852
Chicago, St. Paul, Minn. & Omaha	1,753	811,039	341,074	1,272,903	165,274	228,976	33,233	629,735	14,736	44,213	1,115,756	157,147	84,567	72,220	—249,210
Chicago, Terre Haute & Southeastern	373	243,891	15,514	265,585	21,605	55,661	3,839	92,074	2,222	8,291	183,691	81,894	11,833	70,060	—27
Cincinnati Northern	246	141,113	12,873	158,424	24,539	28,594	2,953	82,418	.....	3,391	141,893	16,531	7,000	9,530	—22,660
Cleveland, Cincinnati, Chic. & St. Louis	2,387	2,301,636	721,480	3,320,921	311,088	704,972	80,252	1,732,669	24,030	82,790	2,934,356	386,565	160,000	226,196	—851,187
Coal & Coke	197	74,047	14,060	92,185	11,499	24,805	1,094	42,648	.....	2,845	82,890	9,296	5,000	4,296	—4,740
Colorado Midland	338	80,294	8,568	96,278	15,079	29,505	6,430	49,825	385	4,872	106,096	—9,818	9,000	—18,818	—9,449
Colorado & Southern	1,103	630,386	105,964	785,297	62,284	141,378	9,470	236,710	4,398	24,629	478,869	306,428	45,000	261,412	61,276
Cumberland Valley	164	258,645	48,708	323,878	18,711	29,663	4,208	113,119	806	9,381	174,845	149,032	8,494	140,539	—5,454
Detroit & Mackinac	383	55,235	19,454	82,910	10,764	20,175	1,752	34,978	.....	3,505	71,175	11,735	8,000	3,734	—8,999
Detroit, Grand Haven & Milwaukee	191	146,000	36,500	215,829	19,082	31,267	5,450	142,948	57	6,371	205,175	10,654	3,620	6,605	—24,258
Duluth & Iron Range	269	74,400	20,802	103,135	47,406	60,286	1,070	81,391	962	10,721	201,835	—98,700	8,105	—106,805	—20,889
Duluth, Missabe & Northern	414	109,530	27,551	155,649	82,368	111,051	2,966	99,027	1,271	17,494	314,178	—158,528	8,412	—166,941	8,740
El Paso & Southwestern Co.	1,028	897,784	214,282	1,169,913	103,144	114,892	20,288	295,736	7,010	27,337	568,407	601,506	38,643	562,862	189,539
Elgin, Joliet & Eastern	801	966,034	39	1,067,210	94,707	328,021	7,132	381,511	.....	20,642	831,864	235,346	47,940	187,406	—214,014
Galveston, Harrisburg & San Antonio	1,361	1,085,562	334,354	1,522,661	190,518	189,807	33,891	473,295	13,984	38,407	931,667	590,994	51,867	538,676	421,988
Galveston Wharf	14	.....	.....	90,322	1,456	1,501	249	24,326	21,740	661	49,932	40,390	10,500	29,890	—17,046
Georgia	307	172,432	64,996	258,857	26,598	41,889	13,611	109,954	132	8,556	200,733	58,125	5,890	52,238	—612
Grand Rapids & Indiana	575	298,419	90,246	427,539	64,566	83,019	9,105	247,003	354	18,380	422,429	5,109	22,205	—17,102	—64,902
Grand Trunk Western	347	451,000	101,600	604,197	72,388	126,876	15,812	295,359	5,544	17,773	533,752	70,445	37,235	33,197	—128,072
Gulf & Ship Island	308	109,962	26,077	145,218	14,196	20,954	3,781	45,969	266	1,633	93,774	51,444	8,957	42,434	—5,193
Houston, East & West Texas	191	102,092	26,799	138,713	18,505	15,574	1,954	49,418	701	2,959	88,925	49,787	7,299	42,327	12,411
Houston & Texas Central	918	399,379	130,517	580,462	85,267	76,814	17,023	193,541	4,302	19,170	395,318	185,144	30,861	154,200	69,978
Illinois Central	4,766	4,476,320	1,204,778	6,229,685	788,091	1,230,234	120,249	2,141,351	47,620	154,877	4,469,949	1,759,735	362,467	1,396,661	178,371
Indiana Harbor Belt	109	.....	.....	355,904	25,606	37,887	2,891	225,311	.....	9,979	301,675	54,229	8,374	45,855	—49,399
International & Great Northern	1,160	557,215	192,175	817,550	127,393	133,800	23,071	337,401	5,094	29,923	640,449	177,101	40,000	136,979	13,662
Kanawha & Michigan	177	193,138	26,944	228,989	34,726	65,497	2,995	81,643	3	7,127	191,991	36,998	16,525	20,459	—80,492
Kansas City Southern	836	786,997	125,250	994,096	102,362	125,548	24,746	310,818	.....	36,239	597,422	396,674	58,055	338,180	90,868
Lake Erie & Western	900	531,167	46,666	608,974	59,822	99,455	12,641	266,327	.....	15,145	453,390	155,584	25,000	130,549	—34,737
Lehigh Valley	1,443	2,736,799	291,952	3,304,753	424,844	645,374	79,216	1,837,779	13,673	85,898	3,084,765	219,988	159,000	60,872	—655,838
Lehigh & Hudson River	97	135,686	3,501	148,862	20,699	23,735	1,279	59,187	.....	4,104	109,003	39,860	5,600	34,259	—20,969
Lehigh & New England	296	213,118	1,439	222,242	31,913	40,091	1,951	71,099	.....	3,314	153,348	68,894	8,835	60,059	—48,600
Long Island	397	291,335	502,653	930,415	155,307	147,862	7,367	540,208	7,241	38,209	895,890	34,525	72,840	—38,330	—112,129
Los Angeles & Salt Lake	1,154	542,132	180,533	806,277	103,263	136,124	32,996	272,990	18,140	22,625	580,796	225,481	52,700	172,757	—36,198
Louisiana Ry. & Navigation Co.	342	142,158	25,500	182,014	27,130	22,228	5,974	72,525	.....	7,383	135,239	46,776	14,500	32,200	7,289
Louisiana Western	208	165,965	70,409	252,988	22,283	34,470	8,329	54,622	2,111	6,989	128,736	124,253	18,107	106,095	31,498
Louisville & Nashville	5,070	3,849,944	1,112,164	5,344,781	612,725	976,785	124,015	1,738,901	32,708	113,581	3,591,856	1,752,925	278,869	1,473,375	9,932
Louisville, Henderson & St. Louis	200	127,837	32,067	170,497	23,436	16,965	4,988	54,960	.....	3,428	103,776	66,721	3,800	62,920	22,114
Maine Central	1,222	659,765	214,891	961,206	121,659	159,976	11,019	500,696	716	26,569	820,473	140,733	58,706	82,015	—122,704
Minn., St. Paul & S. S. Marie	4,228	1,329,318	369,677	1,886,351	221,256	339,148	43,125	880,426	15,367	69,226	1,559,898	326,453	73,785	252,669	—460,714
Missouri, Kansas & Texas System	3,865	2,093,044	692,456	3,016,452	635,109	594,058	64,543	1,290,938	19,985	98,870	2,703,423	313,029	125,870	186,083	71,667
Mobile & Ohio	1,160	743,568	108,203	916,399	113,041	206,640	38,095	335,649	2,451	30,815	726,691	189,707	40,580	148,919	—31,034
Monongahela	108	138,892	9,202	151,215	19,438	9,624	796	40,766	.....	3,946	74,570	76,645	6,000	70,645	—2,683
Monongahela Connecting	6	.....	.....	150,309	26,294	16,515	331	61,278	.....	4,157	108,576	41,733	1,749	39,984	36,083
Morgan's La. & Tex. R. R. & S. S. Co.	401	318,178	112,122	466,362	46,418	66,955	12,297	140,135	2,538	11,978	279,977	186,385	27,705	158,317	101,795
Nashville, Chattanooga & St. Louis	1,237	736,383	247,360	1,095,112	120,375	207,403	50,014	428,773	12,982	35,731	854,946	240,166	30,000	209,376	—17,103
New Orleans, Texas & Mexico	191	86,015	22,736	114,406	20,299	12,611	5,730	34,582	.....	6,308	79,532	34,875	1,400	33,474	39,455
New York, Chicago & St. Louis	570	1,027,033	77,887	1,158,280	117,638	167,580	45,291	635,218	4,217	30,393	1,000,329	157,951	50,000	107,951	—148,870
New York, Ontario & Western	568	400,430	66,225	563,108	64,736	100,348	7,994	273,784	.....	17,805	464,667	98,442	18,000	80,438	—79,003
New York, Philadelphia & Norfolk	112	255,382	33,400	315,787	40,201	66,149	4,604	157,268	4,358	12,481	285,060	30,727	13,500	16,971	—58,525

Traffic News

On account of the accumulation of freight at Galveston, Tex., the Southern Pacific has placed an embargo on all freight, except lumber and government freight, destined for vessels at that port.

The Interstate Commerce Commission has filed a petition in the United States District Court at St. Louis to enjoin the railroads from disobeying its order in the Business Men's League case.

The Illinois Public Utilities Commission will hold a hearing at Chicago, April 13, on the intrastate passenger tariffs filed by the railroads under the order of the Interstate Commerce Commission in the Business Men's League case. The tariffs were suspended by order of the Utilities Commission in December.

The Public Service Commission of West Virginia, in a decision just issued, has refused to permit the Chesapeake & Ohio to advance its passenger fares from 2 cents a mile to 2½ cents. A similar application from the Baltimore & Ohio is still under consideration.

The Pennsylvania, the Philadelphia & Reading and the Baltimore & Ohio have applied to the Pennsylvania Public Service Commission for authority to make general increases in the rates for transportation of freight; 15 per cent on all commodities except coal, coke and ore; and on these articles 15 cents a ton.

The Chicago, Milwaukee & St. Paul put an additional train in service between Chicago, Ill., and Omaha, Neb., on April 1. The train has been named the Iowa-Nebraska Express, and leaves Chicago westbound at 1:05 p. m., arriving at Omaha at 11:05 a. m. and at Sioux City at 12:15 p. m. It has a sleeper to each of these points and makes connections for Des Moines. Eastbound it leaves Omaha at 1:40 a. m. and arrives at Chicago at 2:40 p. m. The St. Paul now has four daily trains each way between Chicago and Omaha.

At a meeting of a hundred or more representatives of important New England manufacturers, held in Boston last week, a resolution was adopted recommending that shippers make no objection to the increase of 5 per cent, which has been announced in the rates of freight from New England to the West by rail and lake. Action was taken also looking to the acceptance for one year of the new demurrage rules proposed by the railroads. A resolution was adopted recommending that the Interstate Commerce Commission should seek the establishment of demurrage bureaus similar to the New England demurrage bureau.

The Delaware, Lackawanna & Western has begun a comprehensive campaign for promoting farming activities in the country adjacent to its lines. President W. H. Truesdale has written to the managers of the 15 farm bureaus maintained by the railroad company in New York and Pennsylvania, outlining a plan for encouraging farmers to grow this year all the food products possible, and in general to adopt intensive farming in all directions. This is declared to be as patriotic a duty as to enlist in the army. A conference of farmers has been called for Saturday of this week at Binghamton, N. Y. The railroad proposes to co-operate with farmers' associations in marketing their products, in getting help from the cities and towns, and in all ways possible.

The Supreme Court of Missouri, sitting in banc, has sustained the tariffs issued by the Public Service Commission on November 10, 1915, making increases in rates throughout the state. Effective at a date yet to be fixed by the commission single trip passenger rates will be advanced from 2 cents a mile to 2½ cents. This ends litigation which has been pending since December, 1915. Freight rates will be increased on intrastate business, an average estimated at 5 per cent. The order of the commission provides that for round-trip tickets the rate shall be 2¼ cents a mile. The roads will be required to sell 500-mile books, good for bearer, and joint interchangeable 1,000-mile mileage books, good for bearer and good on any trunk line in the state, for 2 cents a mile.

The Traffic Club of Chicago elected officers for the coming year on March 27 as follows: President, Charles D. Hopper, general freight agent, Goodrich Transit Company; first vice-president, Murray N. Billings, assistant traffic manager, Illinois Steel Company; second vice-president, Arthur J. Puhl, general agent passenger department, Chicago, Burlington & Quincy; third vice-president, J. C. McAuliffe, general traffic manager, Butler Brothers; secretary, Charles D. Signer, agent, Delaware, Lackawanna & Western. Directors: Floyd L. Bateman, president, Transcontinental Freight Company; F. A. Butterworth, assistant general freight agent, Pere Marquette; Luther M. Walter, commerce counsel, Morris & Co., and E. R. Newman, assistant general freight agent of the Wabash.

The legislature of Georgia has passed a "bone dry" prohibitory law; and the Central of Georgia Railway has issued to station agents a series of regulations showing what is lawful in connection with the transportation of liquors. In general the transportation of all kinds of distilled and fermented liquors, including beverages having not more than 1½ per cent of alcohol, is prohibited. Pure alcohol may be brought into the state for physicians, druggists, manufacturers, etc., to be used only for medicinal, mechanical and scientific purposes; and such shipments must be delivered only on presentation of a permit on a prescribed form from a county officer. Wine for sacramental purposes may be brought into the state, but only once a month; and must be delivered to an officer of the church or religious order by which it is to be used.

Representatives of shipping organizations throughout the United States have been called to a special conference to consider the increase in freight rates which the railways have asked from the Interstate Commerce Commission. The conference will be held at the Hotel LaSalle, Chicago, Ill., on April 13. The associations that appended their signatures to the call for the meeting are: The National Live Stock Shippers' Protective League, the National Industrial Traffic League, the National Petroleum Association, the National Council of Farmers' Co-operative Grain Dealers, the National Wool Growers' Association, the American National Live Stock Association, the Corn Belt Meat Producers' Association, the Western Oil Jobbers' Association, the Western Petroleum Refineries Association, the National Live Stock Exchange, the Ohio Industrial Association and the United States Metal Culvert Association.

The National Industrial Traffic League Committee on Car Demurrage and Storage, after a conference with the committee on relations of the American Railway Association, gave its tentative approval to the demurrage rules suggested by the carriers to replace those expiring May 1. The proposed rules have been submitted to the members of the league for a vote. In substance they are: After the expiration of the free time a charge of $2 per car per day for the first five days, and $5 for the sixth and each succeeding day. Under the average agreement one credit will be allowed for each car released within the first 24 hours of free time, after which one debit per car per day will be charged for the first five days. In no case shall more than five credits be applied in cancellation of debits accruing on any one car. When five debits have accrued on a car $5 per car per day will be charged for all subsequent detention. At the end of the month the total credits will be deducted from the total debits, and $2 per debit will be charged for the remainder.

Illinois Roads Lose Five Per Cent Rate Case

In the decision handed down on March 29, the State Public Utilities Commission of Illinois denied the application of the railroads of the state for a general five per cent increase in freight rates governing all traffic moving intrastate, with the exception of bituminous coal, on which a general advance of five cents a ton and ten cents a ton to upper Mississippi river crossings was asked. These tariffs were filed the latter part of 1914, and, following their suspension, testimony was taken which was finally concluded in the fall of 1916.

Although the proposed increase in commodity rates on coal, including increases in the maximum scale by five and ten cents a ton, was found not justified, an increase of five per cent in

commodity rates and of certain percentages in the maximum scale was allowed. Other advances in commodity rates were allowed as follows: An increase of five per cent on iron and steel articles; an increase of five per cent in livestock rates and the maximum scale for livestock, and an increase in commodity rates on powder and high explosives.

A proposed increase in commodity rates on straw will be disposed of in a separate case now pending before the commission. Proposed changes in rules and regulations governing weighing and reweighing, reconsignment and diversion and overloaded cars, will also be dealt with in a separate order.

Commissioners Walter A. Shaw and Richard Yates delivered dissenting opinions. Mr. Yates concurred in the opinion in so far as it denied an increase in class rates and a ten-cent increase in bituminous coal rates to Mississippi river points. He did not, however, concur in the refusal to raise rates on stone, sand, gravel, on brick, tile and clay, on agricultural implements and vehicles, on petroleum and its products, on packinghouse products, on forest products, on cement, and on miscellaneous commodities, believing that advances on these were justified.

A railroad statistician estimates that the increases on commodity rates granted will add about 1½ per cent to the annual gross receipts on intrastate business. The new rates will add about $400,000 to the annual revenues for the transportation of coal, $50,000 for the movement of stock, and $10,000 for the transportation of iron and steel products, and will mean practically no appreciable increase in the revenues for the movement of powder. The total increases will amount to about $460,000, as compared with annual increased revenues of $1,500,000, which would have resulted had the five per cent increase in class and commodity rates asked by the roads been granted.

Western Car Congestion Disappears

The congestion of western terminals with cars which was so acute during the severe weather several weeks ago has largely disappeared as a result of the earnest efforts of railway operating officers in co-operation with a more favorable temperature. Railroad officers at Chicago declare that the accumulation of cars in that switching district has been disposed of, and that it can now be said that normal conditions are at hand. The embargoes enforced by eastern roads against eastbound traffic have gradually been growing less stringent, and western officers, with their increasing familiarity with and understanding of embargoes, have become more skillful in stopping at the source the freight which will not be accepted by the eastern roads.

Although some western operating officers maintain a favorable attitude toward the new car service rules which went into effect late in February, others declare that eastern lines are persistently disobeying the rules in the hope that the fines provided under them will never be collected. One western road has been delivering an average of 97 more cars per day during the last month than it has received in its exchange with connections. Other western roads have been able to keep about the same percentage of their ownership of cars on their lines as they had previous to the establishment of the new rules, but none reports having experienced an actual gain in car supply. The more optimistic operating officers are of the opinion that not enough time has elapsed to pass fair judgment on the new rules, and that when cars in remote parts of the country reach the home roads, debtor roads will actually experience an increase in their car supply.

Chicago transportation officers state that the insistent complaints by the Chicago Board of Trade of a shortage of cars are without foundation, and that the East never was, and at the present time is not, in danger of famine because of the holding up of grain shipments in Chicago. A railroad officer recently secured figures from the board of trade itself to show the receipt and shipment of cars of grain. For the first 10 days of March the statistics show that 3,435 cars of grain were received in Chicago from western points, and that 2,867 cars passed through the city to the East. During the next days, from March 11 to 20, 2,960 cars were received in Chicago, and 2,288 were shipped East. From March 21 to March 27 2,450 cars were received and 2,373 were shipped East, making a grand total of 16,373 cars handled in and out of Chicago during the entire period.

Commission and Court News

INTERSTATE COMMERCE COMMISSION

The commission has suspended until July 31 increased carload rates on scrap paper, ground limestone and potatoes from Oklahoma points to various destinations in the state of Texas.

The commission has suspended from April 1 and later dates until July 29 the operation of increased rates on various commodities based upon proposed increased class rates applicable between points in Central Freight Association territory now under investigation in I. & S. Docket 965.

The commission has granted the petition of carriers filing the western classification for authority to establish a classification of ores dependent upon the value of the freight. The commission says there appears no cause for refusing to permit the establishment of these classifications which are named in the order, but it does not thereby approve any classification that may be filed under this authority, and they are subject to protest, complaint, investigation and correction if found to be in conflict with any provision of the act.

L. C. L. Minimum Handling Charges

Opinion by the commission:

A rule of the western classification provides for the assessment of loading and unloading charges of 1¼ cents per 100 pounds on less-than-carload shipments transported at carload rates. A proposed change in this rule providing for the assessment of loading and unloading charges on such shipments on the basis of the carload minimum weights is found not justified. (43 I. C. C., 266.)

Fruits and Vegetables

Opinion by Commissioner Clark:

Upon investigation of increased rates and changes in rules applicable to the transportation of domestic fresh fruits, vegetables and melons from southern and southwestern territory, the commission holds that the carriers have justified: increased carload and less-than-carload rates, minimum weights and estimated weights from points east of the Mississippi river; increased refrigeration charges from points in Louisiana on the Louisiana Railway & Navigation Company, and increased rates on fruits, vegetables and melons from points in Louisiana west of the Mississippi river which do not exceed the present rates from New Orleans or the rates to Colorado common points.

It is found that the carriers have not justified increased rates on potatoes from points in Arkansas, Oklahoma, Missouri and Kansas, and increased rates on fruits from Arkansas, Oklahoma and Missouri.

Where the former rates from points in Louisiana west of the Mississippi river were not higher than the former rates from New Orleans or the rates to Colorado common points, the increased rates, to the extent to which they exceed the present rates from New Orleans or the rates to Colorado common points, or to which they increase the discrimination against intermediate points in violation of the long-and-short-haul rule of the fourth section are found not justified.

Increased rates on vegetables of other kinds from Arkansas, Oklahoma and Missouri are found justified in part, but to the extent to which they exceed the differentials stated in the suspended schedules over the former rates on potatoes they are not justified.

Increased rates on watermelons, cantaloupes and muskmelons from Arkansas, Oklahoma and Missouri are found justified in part, but where the former rates were not higher than to Colorado common points, the increased rates, to the extent to which they exceed the rates to Colorado common points or to which they increase the discrimination against intermediate points in violation of the long-and-short-haul rule of the fourth section, they are held not justified. (43 I. C. C., 291.)

STATE COMMISSIONS

The Railroad Commission of Louisiana on its own motion has ordered an investigation of the failure of the railroads operating in the state of Louisiana to supply a sufficient number of suitable cars for the transportation of freight of all classes. The railroads will be required to furnish the commission with a complete list of all cars in freight service in the state of Louisiana, using the average number of cars for the months of May and October, 1916, and January, 1917, specifying the class of each car, its dimensions and whether owned, leased or in temporary service. All interested parties may file a statement with the commission before May 1, showing the number of cars which has been furnished to them by the railroads during those months, and the number which are needed at the time they make their report. After the completion of the investigation the commission will enter an order requiring the carriers to provide suitable equipment sufficient to meet the demands of shippers of all classes of freight.

COURT NEWS

Delay—Evidence of Oral Agreement Excluded

In an action for damages for negligent delay in the shipment of live stock, the Iowa Supreme Court holds that an alleged oral agreement of the station agent to make connections so that the stock would arrive at an intermediate destination at a certain time should have been excluded, since the action was not for deception or false representation.—Hill v. Minneapolis & St. L. (Iowa), 161 N. W., 444. Decided February 19, 1917.

Measure of Damages for Carrying Passenger Past Destination

The Alabama Supreme Court holds that a passenger wrongfully set down at a place other than his destination cannot recover for damages incurred after reaching such destination, unless it is alleged and proved that the railroad had prior notice of peculiar circumstances causing the damage. So it was held that a passenger wrongfully carried past her destination, to which she returned, could not recover for injuries received while going from the station at destination to her mother's home, although she paid her own passage back to destination.—Central of Georgia (Ala.), 73 So., 471. Decided May 11, 1916. Rehearing denied, December 30, 1916.

Crossing Accident—Contributory Negligence

In an action for damages for injury to an automobile truck and goods as a result of a collision at a railroad crossing, it appeared that the plaintiff could have seen the defendant's locomotive when thirty feet away, and was driving the truck at such a speed that it could have been stopped at any time within ten feet. The Illinois Appellate Court held that the plaintiff was guilty of contributory negligence. The court said that the law would not tolerate the absurdity of allowing the plaintiff to testify that he looked but did not see the train, when the view was unobstructed, and if he had properly exercised his sight he must have seen it. Cline v. C. M. & S. P., 198 Ill. App., 165.

Tariff Passenger Rates—Ejection

In an action for alleged wrongful ejection it appeared that the plaintiff had tendered 13 cents as the lawful fare between two stations, the conductor demanding 15 cents, the fare according to the published tariff. Judgment for the defendant was reversed by the Alabama Supreme Court, and the cause remanded because of the absence of sufficient evidence of the filed tariff in the shape of an efficiently certified copy thereof. As stated by Mr. Justice Mayfield in a dissenting opinion, the sole difference between the plaintiff and the conductor was that the tariff furnished the conductor showed the distance to be 5.1 miles, while the contention of the plaintiff was that it was exactly 5 miles or less—not a fraction more. The dissenting opinion stated in substance that the plaintiff appeared to have entered the train, not for the purpose of being carried, but for the purpose of being ejected and then bringing suit for damages; and that it was not the law that a passenger who boards a train without a ticket may dispute the distance between two stations, and decline to pay for the distance shown by the conductor's tariff, and—the conductor declining to carry him without his paying for the distance so shown—thereafter, in a suit, recover damages.—Adams v. Central of Georgia (Ala.), 73 So., 650. Decided December 21, 1916.

Suspension of Penalty During Pendency of Injunction Suit

The Missouri Supreme Court holds that, both on principle and authority, under the state constitution, guaranteeing judicial remedies for all injuries, and article 4, section 2 of the United States Constitution, and the fourteenth amendment extending such privileges to all citizens of the United States, the penalty portion of the state statute prescribing maximum freight rates is suspended during the pendency of a suit in the federal courts to enjoin the enforcement of the statute. This rule has been followed by the United States Supreme Court and various state courts in the case of similar statutes.—White v. Delano (Mo.), 191 S. W., 1,012. Decided December 21, 1916. Rehearing denied February 13, 1917.

Opportunity to Buy Ticket

In an action for damages for attempted ejection with force from a train after the plaintiff had tendered to the conductor the price of a ticket he had failed to procure before boarding the train, the South Carolina Supreme Court holds that evidence that the ticket office was closed at a time 35 minutes before the train actually departed (the bulletin showed the train was 20 minutes late), without evidence that it remained closed from that time until the departure of the train, is not sufficient to warrant a finding that the plaintiff had no reasonable opportunity to purchase a ticket before boarding the train, and judgment for the plaintiff was reversed and a non-suit granted.—Read v. Atlantic Coast Line (S. Car.), 91 S. E., 378. Decided February 17, 1917.

Throwing Mail Sacks from Moving Train

The Kansas Supreme Court holds that a railroad company is not primarily liable for the negligence of a postal agent in throwing mail sacks from a moving train, but may become liable where it knowingly permits such practice where it may endanger persons lawfully at the place of delivery. A brakeman walking along the side of the main track to a switch at night was struck and injured by a mail sack thrown from a train moving about 50 miles an hour. The rule of the postal department was that sacks are to be put off near the mail crane, and this sack was discharged about 60 feet from the crane. The place selected for the discharge of the sacks was beyond the station platform, and where there was little danger of injuring persons who might have occasion to be at the station. It was held that the evidence did not support the findings of the jury that the defendant railroad was negligent in knowingly permitting the United States postal agents to pursue a dangerous practice, and in failing to report recklessness to the proper authorities; and judgment for the plaintiff was reversed and a new trial ordered.—Ergenbright v. St. Louis, I. M. & S. (Kan.), 163 Pac., 173. Decided February 10, 1917.

Necessity for Electric Switch Protection; a Question for Experts

In an action for injuries to a passenger caused by the derailing of a train at an open switch, which the defendant, the D. L. & W., claimed was opened maliciously, the plaintiff offered proof that there is a "standard switch stand," which, as soon as the switch is touched, gives an electric automatic caution signal at a point some distance in the rear of the switch. The accident happened on the Syracuse division of the defendant's road, single track, over which there was comparatively little traffic. The Circuit Court of Appeals, Second Circuit, held that the testimony offered could only be made relevant or material if followed by proof that such an arrangement was commonly used under similar conditions in similar country with similar traffic. No such proof was offered by the plaintiff, and the defendant called expert witnesses to the contrary. It was held error to submit to the jury the question whether it was negligence for the railroad not to use such a signal, since that issue was one for railroad experts, not one which the ordinary juror was competent to determine from his own knowledge or experience. Judgment for the plaintiff was reversed and a new trial granted.—D. L. & W. v. Donahue, 238 Fed., 770. Decided December 13, 1916.

Railway Officers

Executive, Financial, Legal and Accounting

J. Moultrie Lee, assistant treasurer of the Atlantic Coast Line at Savannah, Ga., has retired under the pension rules of the company.

R. W. Rigdon has been appointed freight claim agent of the Missouri, Kansas & Texas of Texas, with headquarters at Dallas, Tex., vice Joe Marshall, transferred in charge of cause and prevention bureau.

The following have been elected officers of the Pittsburgh & West Virginia, which is the successor of the Wabash Pittsburgh Terminal: W. H. Coverdale, chairman; H. E. Farrell, president; H. F. Baker, vice-president and general counsel; H. C. Moore, treasurer, and F. J. Bruner, secretary.

The officers of the Augusta Southern are now as follows: Franklin Q. Brown, president; H. C. Huffer, Jr., vice-president; D. F. Kirkland, vice-president and general manager; J. H. Conley, secretary and auditor; M. T. Solomon, treasurer; W. O. Wall, general claim agent, and Barrett & Hull, general counsel. All will have headquarters at Augusta, Ga. D. F. Kirkland is general manager, J. H. Conley is auditor, M. T. Solomon is treasurer and W. O. Wall is general claim agent, also of the Georgia & Florida.

Theodore V. Pomar, who has been appointed comptroller and assistant treasurer of the Florida East Coast, with headquarters at St. Augustine, Fla., as has already been announced in these columns, was born on December 16, 1868, at St. Augustine, Fla. He was educated in a parochial school of his native town and at the state military school, Gainesville, Fla. On May 1, 1893, he began railway work with the Florida East Coast in the accounting department, and later served in all branches of freight and passenger accounting, disbursements and general accounts until July 1, 1900, when he was made chief clerk. On February 1, 1909, he was appointed auditor; in September, 1914, he was promoted to general auditor, and now becomes comptroller and assistant treasurer of the same road, as above noted.

Operating

The office of T. W. Parsons, general manager of the Charlotte Harbor & Northern, has been removed from Boca Grande, Fla., to Arcadia.

R. C. Walker has been appointed superintendent of mail transportation of the Delaware & Hudson, with office at Albany, N. Y.

The headquarters of E. J. Devans, general superintendent of the Buffalo, Rochester & Pittsburgh, will be moved from Rochester, N. Y., to Du Bois, Pa., on April 15.

J. H. Rightmeyer, manager and chief engineer of the Kentucky & Indiana Terminal Railroad, Louisville, Ky., has resigned, and C. R. Arnold, secretary, is now acting manager and chief engineer.

W. Blanchard has been appointed chief train despatcher of the Georgia & Florida vice J. S. Douglas, trainmaster at Douglas, Ga., resigned to accept service with another company, and the position of trainmaster has been abolished.

W. M. Haver, assistant superintendent of the Pittsburgh division of the Baltimore & Ohio at Pittsburgh, Pa., has been appointed superintendent of the Wheeling division, with office at Wheeling, W. Va., succeeding F. G. Hoskins, transferred to other duties.

E. C. Manson, superintendent of transportation and telegraph of the Oregon Short Line, at Salt Lake City, Utah, has been appointed superintendent of transportation of the Union Pacific System, succeeding W. A. Whitney, resigned to become general manager of the Ogden, Logan & Idaho, with office at Ogden, Utah.

J. A. White, superintendent and car accountant of the Augusta Southern, at Augusta, Ga., has been appointed superintendent, with office at Augusta, and the authority of W. C. Griffin, car accountant of the Georgia & Florida at Augusta, has been extended over the Augusta Southern.

Joe Marshall, freight claim agent of the Missouri, Kansas & Texas of Texas, at Dallas, Tex., has been appointed superintendent claim prevention of the Missouri, Kansas & Texas, the Missouri, Kansas & Texas of Texas, and the Wichita Falls & Northwestern, with headquarters at Dallas.

W. J. Leahy, freight terminal superintendent of the Illinois, Central, with office at Chicago, Ill., has been appointed superintendent of freight service, with headquarters at Fordham (Chicago), Ill. A. M. Umshler, trainmaster of the Yazoo & Mississippi Valley at Memphis, Tenn., has been appointed trainmaster of freight service at Chicago, Ill. Daniel E. Hilgartner, trainmaster at Chicago, has been appointed superintendent of passenger service, with the same headquarters.

Elisha Lee, who has been appointed general manager of the Pennsylvania Railroad lines east of Pittsburgh and Erie, with headquarters at Philadelphia, Pa., as has already been announced in these columns, was born on September 24, 1870, at Chicago, and graduated from the Massachusetts Institute of Technology in the class of 1892. He entered the service of the Pennsylvania Railroad in November of the same year as a rodman in the office of the division engineer on the Tyrone division. From August, 1895, to October, 1897, he was on leave of absence. In April, 1899, he was appointed assistant supervisor, and two years later was promoted to supervisor. In August, 1903, he was appointed assistant engineer in the maintenance of way department, and in April, 1907, was promoted to principal assistant engineer on the Philadelphia, Baltimore & Washington. On March 24, 1909, he was appointed superintendent of the New York, Philadelphia & Norfolk, and two years later was promoted to assistant to the general manager of the Pennsylvania Railroad, lines east of Pittsburgh and Erie. In April, 1914, he was appointed general superintendent of the Philadelphia, Baltimore & Washington, with office at Wilmington, Del., remaining in that position until May, 1916, when he was appointed assistant general manager of the Pennsylvania Railroad, with headquarters at Philadelphia, and now becomes general manager of the same road as above noted. Mr. Lee served also as chairman of the Conference Committee of Managers of the Eastern Railroads of the United States from 1912 to 1914. In that position he had charge, on behalf of the various railroads interested, of the negotiations with the trainmen's brotherhoods, and of the presentation of the railroads' case in the arbitration of employees' demands for increased pay. From 1915 to date he has been chairman of the National Conference Committee of Railroads, representing practically all the railroads in the United States in the recent controversy with the trainmen.

Elisha Lee

A. W. MacElveny, announcement of whose appointment as superintendent of the St. Louis-San Francisco, with office at Enid, Okla., has already been made in these columns, was born at Fredericton, N. B., on May 5, 1882. From 1900 to 1904 he held clerical and stenographic positions in the operating and engineering departments of the Northern Pacific at St. Paul, Minn. From 1904 to 1908 he was stenographer and private secretary to the vice-president and general manager and the general superintendent of the Gulf, Colorado & Santa Fe. In 1908 he was appointed chief clerk to the superintendent of transportation of the St. Louis & San Francisco, and in 1911 he became secretary and auditor of the Temple & North Western at Temple, Tex. In August, 1912, he returned to the Gulf, Colorado & Santa Fe as chief clerk to the assistant general manager. He

was later chief clerk to the general manager, and in January, 1917, was appointed inspector of transportation and maintenance of way of the St. Louis-San Francisco, which position he held at the time of his appointment as superintendent of the western division. He succeeds E. C. Lilley, transferred.

W. S. Williams, division superintendent of the Illinois Central, with office at Carbondale, Ill., has been appointed terminal superintendent at Chicago, succeeding George W. Berry, resigned on account of ill health. William Atwill, division superintendent at Dubuque, Ia., has been transferred to Carbondale, succeeding W. S. Williams. L. E. McCabe, division superintendent at Mattoon, Ill., has been transferred to Dubuque. H. J. Roth, trainmaster at Carbondale, Ill., has been appointed superintendent, with headquarters at Mattoon, succeeding L. E. McCabe, transferred.

Traffic

William Haywood, chief clerk to the vice-president in charge of traffic of the Illinois Central, with office at Chicago, Ill., has been appointed assistant general freight agent, with the same headquarters.

John P. Bowe, acting general freight and passenger agent of the Trinity & Brazos Valley at Houston, Tex., has been appointed assistant general freight agent, John A. Hulen, former general freight and passenger agent having returned to duty after a leave of absence in connection with military duty on the Mexican border.

W. F. McPhail, assistant general baggage agent of the Pennsylvania Railroad at Philadelphia, Pa., has been appointed general baggage agent of the lines east of Pittsburg and Erie, to succeed F. J. McWade, who was relieved form active service on April 1 under the pension regulations of the company; A. A. Brown, chief clerk to the passenger traffic manager, has been appointed assistant general baggage agent, to succeed Mr. McPhail.

W. W. Richardson, general passenger agent of the Pennsylvania Lines west of Pittsburgh, with office at Pittsburgh, Pa., has had his jurisdiction extended over the St. Louis system, suceeding J. B. Modisette, deceased. F. A. Bauchen, assistant general passenger agent at Indianapolis, Ind., has been transferred to St. Louis, Mo. He will be succeeded at Indianapolis by J. C. Millspaugh, assistant to the general passenger agent at St. Louis.

T. E. Harris, general freight and passenger agent, and W. D. Cook, assistant general freight agent of the Georgia & Florida at Augusta, Ga., have had their authority extended over the Augusta Southern. The following commercial agents of the Georgia & Florida have also had their authority extended over the Augusta Southern: W. H. L. Nelms, at Atlanta; M. L. Schultz, Chicago; D. F. Brady, Savannah, Ga.; H. A. Saye, Augusta, and H. H. Thompson, Swainsboro.

W. O. Sydnor, assistant general freight agent of the Chesapeake & Ohio, at Charleston, W. Va., has been transferred in the same capacity to Huntington, W. Va. George D. Moffett, commercial agent at Louisville, Ky., has been appointed division freight agent, with office at Charleston, W. Va., and J. C. Shively has been appointed commercial agent, with office at Louisville, Ky., succeeding Mr. Moffett. H. M. Hall, general agent, freight department, of the Chesapeake & Ohio of Indiana, at Chicago, having resigned to engage in other business the position of general agent is abolished.

Edward A. Campbell, whose appointment as general freight and passenger agent of the Kansas City North Western, with office at Kansas City, Kan., was announced in these columns two weeks ago, was born at St. Joseph, Mo., on March 20, 1869. He entered railway service on March 8, 1883, as a clerk in the division freight office of the Southern Pacific. On January 1, 1884, he became a clerk in the general freight and passenger office of the St. Joseph & Grand Island. On April 1, 1889, he was appointed clerk and cashier for the Chicago Great Western, and on November 13, 1891, was made rate clerk for the Western Trunk Line committee, with office at Kansas City, Mo. On March 1, 1892, he re-entered the service of the Chicago Great Western as chief clerk in the local freight office at St. Joseph, and was promoted from chief clerk to assistant general freight agent in June, 1893. In October, 1896, he was appointed assistant freight agent of this company at Kansas City, Mo., and was advanced to freight agent at Leavenworth, Kan., in 1898. In 1904 he was transferred with the same title to St. Joseph, Mo., and held that position until appointed supervisor of station service, with office at St. Paul, Minn., in 1906. The following year he was agent at the same point. From 1908 to 1909, inclusive, he was trainmaster of the Northern division at St. Paul, Minn., and in 1910 he was appointed agent at Kansas City, Mo. On March 1, 1917, he was appointed general freight and passenger agent for the Kansas City Northwestern, as noted above.

Engineering and Rolling Stock

The authority of E. B. Eppes, chief engineer of the Georgia & Florida, at Augusta, Ga., has been extended over the Augusta Southern.

C. E. Nagle has been appointed chief engineer of the Louisiana & Pine Bluff, with headquarters at Huttig, Ark., succeeding W. H. Lee.

The office of H. Stanley, engineer of roadway of the Charlotte Harbor & Northern, has been removed from Boca Grande, Fla., to Arcadia.

Harry Alfred Lane, who has been appointed chief engineer of the Baltimore & Ohio, with headquarters at Baltimore, Md., as has already been announced in these columns, was born on July 30, 1874, at Foxboro, Mass. After completing a four years' course at Tufts College, Massachusetts, in 1897, with the degree of B. S. C. E., he later took a post-graduate course for three years. While a student at Tufts he spent his summer vacations in the engineering department of the New York, New Haven & Hartford, starting in 1895 as a rodman on an engineering corps. In September, 1900, he was appointed trainsitman at Tiverton, R. I. He was promoted to assistant engineer in November, 1901, and put in charge of the northern half of an improvement for the abolition of grade crossings at Fall River, Mass. Mr. Lane became connected with the Baltimore & Ohio in 1902, and in 1904 he became a field engineer. He was promoted in April, 1905, to the position of assistant engineer in charge of all field engineers and parties, preliminary surveys, locations, office projections and reports for extensions and betterments. In July, 1907, he was placed in charge of the designing of freight terminal improvements, and one year later was appointed assistant to the engineer of maintenance of way. In June, 1910, he was promoted to assistant engineer of surveys, and since September, 1916, was assistant to chief engineer, until his recent appointment as chief engineer of the same road, as above noted.

H. A. Lane

The authority of W. H. Dyer, master mechanic of the Georgia & Florida, at Douglas, Ga., has been extended over the Augusta Southern.

C. F. Urbut, assistant engineer of the Chicago, Milwaukee & St. Paul, has been appointed engineer of track elevation, with headquarters at Chicago, Ill., succeeding C. H. Buford, transferred.

James Hall, master car repairer, Coast division, Southern Pacific, with headquarters at San Francisco, Cal., has been appointed general car foreman at Sacramento, in full charge of the passenger car department.

J. H. McGoff, mechanical superintendent of the eastern lines of the Atchison, Topeka & Santa Fe, at Topeka, Kan., has been transferred to Fort Madison, Iowa, as mechanical superintendent of the eastern half of the eastern lines, which have been divided into two districts, and I. C. Hicks, master mechanic at San Bernardino, Cal., has been appointed mechanical superintendent

of the western district of the eastern lines, with headquarters at Topeka, Kan.

Purchasing

The authority of S. W. Saye, purchasing agent of the Georgia & Florida at Augusta, Ga., has been extended over the Augusta Southern.

Frank S. Austin, supervisor of the Boston & Albany, at Boston, Mass., has been appointed general storekeeper, with headquarters at West Springfield. This is a new position recently created.

OBITUARY

C. R. Duncan, of Sparta, Ill., superintendent of the Illinois Southern, was killed at Sparta on the evening of March 29 while riding, together with several other railroad men, on a motor car, on the track near the shops of the company. The motor car collided with a coal car.

Elmer H. Wood, formerly freight traffic manager of the Union Pacific, with office at Omaha, Neb., died at his home at Lombard, Ill., on March 31, 1917, aged 62. He was born at Clarkson, Monroe county, New York, on January 12, 1854. In 1875 he entered railway service with the Chicago & Pacific as a station agent, and later was chief clerk in the general freight and passenger department. From June, 1876, to May, 1884, he was chief clerk to the general agent of the Union Pacific at Chicago, and from May, 1884, to July, 1888, he was general agent in the freight department. From 1888 to 1889 he was chief clerk in the general freight deparment at Kansas City, Mo., and from 1889 to June 1, 1898, he was assistant general freight agent at Omaha, Neb. On June 1, 1898, he was appointed general freight agent, and on October 30, 1911, was promoted to freight traffic manager. He retired from active service on November 1, 1915.

Arthur Brown, pioneer railway engineer, associated with Leland Sanford, Mark Hopkins and Collis P. Huntington in the early days of railway construction in the far west, died from pneumonia at his home at Oakland, Cal., on March 16, 1917, aged 86 years. He was born at Kentore, Scotland, in 1830. He gained his early railway experience in the states of New York, Pennsylvania and Missouri, going to California in the early sixties. Upon reaching the far west he entered the service of the Central Pacific as superintendent of bridges and buildings, and remained in that capacity with that road and its successor, the Southern Pacific, for nearly 35 years. During his active career he designed and constructed a large number of buildings, bridges, snow-sheds and other facilities as far east as Ogden, Utah. Later he erected the majority of the bridges and buildings of the northern and southern branches of the Southern Pacific. He retired from active service about 20 years ago.

John A. Anderson, author of "The Train Wire," and for 52 years in the service of the Pennsylvania Railroad and its predecessors, died at his home in Lambertville, N. J., March 18, at the age of 88. Mr. Anderson was born in Flemington, N. J., and entered railway service in 1848 as rodman in the location of the Belvidere-Delaware, now the Belvidere branch of the Pennsylvania. He was made superintendent of that road on July 1, 1870, and continued in that position when the road came into the hands of the Pennsylvania. He remained there until 1886, when he was appointed the first superintendent of the Relief Department of the Pennsylvania Railroad. On January 1, 1900, he was retired under the pension rules. "The Train Wire," first published in 1883 and re-written and enlarged in 1891, was the first thorough and scientific discussion of the American system of train despatching. It was a model of exact knowledge and careful writing, and was the forerunner of the despatching rules in the standard code of the American Railway Association, now used everywhere in America. Indeed, Mr. Anderson, working with a committee of officers of the Pennsylvania Railroad, was a chief factor in the original code of despatching rules, prepared for that road, which, by revision and accommodation to the views of different railroad officers, later became the standard code. The duplicate order system, a vital feature of the train despatching rules as used today, was little known in 1883 and poorly appreciated; and to Mr. Anderson the railroad world is largely indebted for the general adoption of the system. He was a frequent contributor to the *Railroad Gazette*.

Equipment and Supplies

LOCOMOTIVES

THE CHICAGO & EASTERN ILLINOIS has issued inquiries for 7 Santa Fe type locomotives.

THE CAROLINA, CLINCHFIELD & OHIO has ordered 9 Mikado and 7 Mallet locomotives from the Baldwin Locomotive Works.

THE CANADIAN GOVERNMENT RAILWAYS have ordered 50 additional Mikado locomotives from the Canadian Locomotive Company.

THE CHICAGO, ST. PAUL, MINNEAPOLIS & OMAHA is in the market for 10 Mikado, 5 switching and 5 six-wheel switching locomotives.

THE SOUTH AFRICAN RAILWAYS have ordered 8 Mallet type locomotives from the American Locomotive Company. These locomotives will have 16½ and 26 by 24-in. cylinders, and a total weight in working order of 194,000 lb.

THE CHICAGO & NORTH WESTERN has ordered 50 Mikado locomotives from the American Locomotive Company. These locomotives will have 27 by 32-in. cylinders, and a total weight in working order of 303,000 lb. The Chicago & North Western still remains in the market for 20 Mikado, 20 six-wheel switching and 10 Pacific locomotives.

FREIGHT CARS

THE NORFOLK & WESTERN is in the market for 300 refrigerator cars.

THE ISLAND PETROLEUM COMPANY is inquiring for 25 tank cars.

THE CENTRAL OF GEORGIA will build 100 stock cars in its own shops.

THE SHERWIN-WILLIAMS COMPANY has issued inquiries for 10 tank cars.

THE WAR DEPARTMENT has ordered one heavy gun car from the Magor Car Company, and will open bids on April 10 on 4 railway cars for six-inch and eight-inch gun carriages.

THE SALT LAKE & UTAH is in the market for 25 to 30 steel gondola cars. An additional inquiry for 15 box cars has also just been issued.

THE CHICAGO SHORT LINE, within the last few days tentatively in the market for 20 flat cars, has withdrawn this inquiry on account of the high prices quoted by builders.

THE LOS ANGELES & SALT LAKE, reported in the *Railway Age Gazette* of February 9 as inquiring for 6 caboose cars, has ordered these cars from the Mount Vernon Car Manufacturing Company.

THE SOUTHERN RAILWAY has ordered 750 refrigerator cars from the Lenoir Car Works. An unconfirmed report in the *Railway Age Gazette* of March 16 to the effect that this road has ordered 2,000 cars from the Pressed Steel Car Company has been denied.

THE PHILADELPHIA & READING has ordered 500 gondola cars from the Standard Steel Car Company, 500 gondola cars from the Pressed Steel Car Company, 500 box cars from the American Car & Foundry Company, and 500 box cars from the Pullman Company.

PASSENGER CARS

THE MISSOURI, KANSAS & TEXAS is reported as contemplating the purchase of about 25 passenger cars.

THE CHICAGO, MILWAUKEE & ST. PAUL, reported in the *Railway Age Gazette* of March 2 as being in the market for 10 baggage cars, has ordered 20 baggage cars from the Standard Steel Car Company.

IRON AND STEEL

THE BALTIMORE & OHIO has ordered 650 tons of steel from the Fort Pitt Bridge Works.

THE SOUTHERN PACIFIC has ordered 2,500 tons of steel from Milliken Brothers, Inc., for transmission towers.

THE DELAWARE, LACKAWANNA & WESTERN has ordered 200 tons of bridge steel from the Fort Pitt Bridge Works.

THE LEHIGH VALLEY has ordered 150 tons of steel for two roundhouses from the Kellogg Structural Steel Company, Buffalo.

THE CHESAPEAKE & OHIO has ordered 200 tons of bridge steel from the American Bridge Company and 600 tons from an independent shop.

THE PENNSYLVANIA RAILROAD has ordered 1,000 tons of bridge steel from the Phoenix Bridge Company for a bridge at Manayunk, Pa.

THE ILLINOIS CENTRAL has ordered 171 tons of steel from the American Bridge Company for one double track deck plate bridge composed of three spans and two towers over the Des Plaines river near Broadway, Ill.; 269 tons from the same company for eye beams and repair material for the Yazoo river bridge, and 110 tons for the Walnut street subway at Bloomington, Ill.

TRACK SPECIALTIES

THE PHILADELPHIA & READING is reported as having placed orders for 900,000 tie plates.

SIGNALING

THE MISSOURI PACIFIC has ordered from the General Railway Signal Company a Saxby & Farmer mechanical interlocking, with a machine of 32 spaces and 22 working levers, to be installed at Council Grove, Kan.

THE BUFFALO, ROCHESTER & PITTSBURGH is to instal automatic block signals on its Indiana branch, between Home and Marion Center, four miles. The material has been ordered from the General Railway Signal Company.

THE CHICAGO & NORTHWESTERN is installing automatic block signals on its line, single track, between Clyman, Wis., and Wyeville, 102 miles; and also between Shoreline, Wis., and Rosemere, 45 miles. The arrangement is the "absolute permissive block system" of the General Railway Signal Company, which company has furnished the material.

COAL CARRIED ON ENGLISH RAILWAYS.—Of the quantity of coal and coke produced in England in 1915 over 155,000,000 tons were carried on the railways, compared with 7,135,000 tons by canals.

LIGHT RAILWAYS IN WAR.—When the railway history of the war comes to be written, it will be incomplete unless a special volume is devoted to the part played by light railways. What we have in our mind is light railways proper, narrow gage and with lightweight rails, which can be laid quickly over any ground on which railway construction and operations are at all feasible. Lines of this nature have been used in all the main theaters of the campaign, and their employment ranges from the transport of troops and guns, shells and foodstuffs, to the conveyance of water supplies and the speedy evacuation of the wounded. Motive power is—according to circumstances—steam, electricity, petrol, and even horses, while in certain instances ordinary road motor cars have been fitted with flanged metal wheels and thus used for railway purposes. The use of light railways for moving artillery, even of heavy caliber, is well known and has been described in numerous press despatches, and on occasion the Germans have even employed rail transit in order that a large trench mortar normally kept at some distance behind the enemy lines might be brought up to a point where its presence would not be expected. This particular device has, however, in at least one instance, been frustrated by the activity of our observers, with the result that the mortar and the locomotive which hauled it were alike blown to pieces by a well-directed British shell.—*Railway Gazette, London.*

Supply Trade News

J. A. Meaden, vice-president of Paul Dickinson, Inc., Chicago, has resigned to become sales manager of the Automatic Screw Machine Products Company, Chicago.

W. A. Means, secretary of the B. F. Goodrich Company, has been elected second vice-president of the company and has been succeeded by L. D. Brown, cashier of the First-Second National Bank of Akron. Mr. Means has been connected with the B. F. Goodrich Company for almost 20 years. He has been treasurer for seven years, previous to which he was assistant treasurer for 12 years.

Elbert H. Gary, chairman of the board of the United States Steel Corporation, announced on March 3 that it had been decided to increase about ten per cent the wage rates and salaries up to $2,500 of the employees of the subsidiary companies, to take effect on May 1. This makes the fourth advance of ten per cent since the first of 1916, making a total increase of more than 46 per cent compounded.

Harvey B. Slaybaugh, assistant secretary of the American Arch Company since 1910, has been elected secretary of the company, effective March 1, 1917. Mr. Slaybaugh was born in 1872 at Wooster, Ohio. He was educated in the public schools at Kingsville, Ohio, and Oberlin College. In 1893 he entered the service of the Lake Shore & Michigan Southern at Norwalk, Ohio, and worked in the locomotive department. He served in various capacities as timekeeper, stenographer, accountant and storekeeper to January, 1899, at which time he was transferred to the office of the superintendent of motive power. In 1908 he was appointed chief motive power clerk, in charge of both locomotive and car work. In July, 1910, he left railway service to become assistant secretary of the American Arch Company, which position he held until elected secretary of that company.

H. B. Slaybaugh

The Keith Railway Equipment Company, Chicago, announces that it has purchased all of the property, assets, business, contracts and good will of the Keith Car Company. The new company will continue to conduct the business under the same management and in the same manner as in the past. It is stated further that it will broaden its field by handling a line of railway mechanical supplies.

J. W. Kelker, formerly of the engineering department of the American Locomotive Company, has been appointed mechanical engineer of the Pilliod Company, succeeding Ross G. Graham, resigned. He will take up his new duties April 16. K. J. Eklund, assistant to the president of the Pilliod Company, with office at New York, has been transferred to the Chicago office as assistant to Burton W. Mudge, president of Mudge & Co. and vice-president of the Pilliod Company.

Detailed plans are now completed and in the course of execution for rebuilding the burned portion of the plant of the Hydraulic Press Manufacturing Company, on its present site in Mount Gilead, Ohio. The plans also include the erection of two additional buildings which will give more adequate manufacturing facilities for the rapidly expanding business. In all, the plans cover the erection of four complete new buildings consisting of a machine shop, a three-story stock room, a new power plant

and a structural and forge shop. The machine shop and stock room are replacements on a much larger scale of the portion of the plant recently destroyed by fire. It is planned to have the new buildings in operation by July 1.

The Bradford-Ackermann Corporation, recently formed by A. H. Ackermann and C. C. Bradford, with offices in the 42nd Street building, New York, announces that it has concluded arrangements with Ashton, Laird & Co. for the sole selling rights of "Astra" high temperature gas apparatus and oxygen welding appliances, manufactured from the designs and patents of E. Raven Rosen-Baum, consulting engineer on high temperature gases. In addition to the extensive line of oxy-acetylene welding appliances, there will be marketed a new and standardized line of oxy-illuminating gas apparatus exclusively manufactured by this company. In this process either natural or artificial illuminating gas, direct from the town supply, is substituted as a supporting gas in connection with oxygen.

The Vapor Car Heating Company, Inc., has taken over all of the heating and ventilating business of the Chicago Car Heating Company and the Standard Heat & Ventilation Company, Inc. The main office and headquarters of the consolidated company will be in the Railway Exchange, Chicago. The following officers have been elected: Egbert H. Gold, president; J. E. Buker and J. Allan Smith, vice-presidents; Samuel Higgins, vice-president and treasurer; Winthrop Gold, assistant treasurer; Edward A. Schreiber, general manager; Arthur P. Harper, secretary and controller, and Otto R. Barnett, general counsel. Branch offices have been established in New York City in charge of Samuel Higgins and George T. Cooke; Boston, Mass., in charge of Frank F. Coggin; Montreal, Can., in charge of F. A. Purdy, and S. P. Harriman; Washington, D. C., in charge of Harry F. Lowman, and Atlanta, Ga., in charge of Lewis B. Rhodes.

Leslie W. Millar, formerly sales manager of Fahn-McJunkin, Inc., New York City, has been appointed special railroad representative of the Mark Manufacturing Company, Chicago. He was born at Boston, Mass., March 22, 1879, and graduated from the Massachusetts Institute of Technology, with the degree of bachelor of science, in 1902. He was engaged on various engineering works from that time until 1904, when he became connected with the Edison Electric Illuminating Company, Boston, Mass., as assistant erecting engineer. In 1909, he became associated with the Good Products Company, Chicago, as eastern sales agent, and in 1911 returned to the Edison Electric Illuminating Company as efficiency engineer. In 1913 he resigned to become eastern representative of the Barco Brass & Joint Company, Chicago, which position he held until January, 1917, when he became sales manager of Fahn-McJunkin, Inc.

L. W. Millar

E. N. Layfield, secretary of the Western Society of Engineers, has resigned, effective May 1, to become associated with W. F. M. Goss, president of the Railway Car Manufacturers' Association. Mr. Layfield has been secretary of the Western Society of Engineers for about a year, practically all of his previous experience having been in railway engineering work. Beginning in 1892 he was employed in maintenance of way and construction on the Pennsylvania Railroad between Philadelphia and Washington. He entered the services of the Chicago Terminal Transfer Company in 1899, serving as chief engineer of that company from 1905 till 1910, when the road was taken over by the Baltimore & Ohio as the Baltimore & Ohio Chicago Terminal. He remained with the last named company one year longer in the capacity of division engineer, when he resigned to engage in private consulting practice, specializing in grade separation investigations. He accepted the position of assistant secretary of the Western Society of Engineers late in 1915, and was appointed secretary on January 21, 1916. Mr. Layfield's headquarters will be with Mr. Goss at 61 Broadway, New York, the headquarters of the association.

Frank N. Grigg was recently elected manager of sales for the car department of the Harlan & Hollingsworth Corporation. He succeeds Henderson Weir, deceased, in that capacity, but does not succeed him as secretary, as was incorrectly reported in the *Railway Age Gazette* of March 16. Mr. Grigg was born at Richmond, Va., August 9, 1876, and was educated in the public schools of that city. He entered the service of the Chesapeake & Ohio at Richmond, Va., in February, 1892, working in the motive power and stores departments. He left that road in January, 1903, to go with the Adams & Westlake Company of Chicago as sales representative in the eastern territory, with headquarters at Philadelphia. In January, 1913, he became district manager of the Standard Heat & Ventilation Company, with headquarters at Washington, D. C., but in January, 1914, left the service of that company and opened offices at Richmond, Va., representing in the southeastern territory the Acme Supply Company, the Heywood Brothers & Wakefield Company, and the Transportation Utilities Company, which accounts he will continue to handle in connection with his duties as manager of sales for the car department of the Harlan & Hollingsworth Corporation. Mr. Grigg's headquarters will be as heretofore at 1201 Virginia Railway and Power building, Richmond, Va.

F. N. Grigg

Westinghouse Employees Hold Annual Dinner

Nearly 500 Westinghouse employees participated in the seventh annual dinner held Saturday evening, March 24, in the English room of the Fort Pitt Hotel, Pittsburgh, under the auspices of the Westinghouse club. On account of the illness of C. H. Lewis, president of the Westinghouse Club, H. D. Shute, treasurer of the Westinghouse Electric Company, presided and introduced the toastmaster, E. H. Sniffin. The speakers of the evening were E. M. Herr, president of the Westinghouse company, who praised the loyalty of men who have been with the firm for years, and who, he stated, will stand by the nation in case of war; Farley M. Osgood, assistant general manager of the Public Service Electric Company of Newark, N. J., who spoke on "Engineering," and Rev. Daniel L. Marsh, pastor of the Smithfield Avenue Methodist Episcopal Church, who spoke on "A Challenge to Engineers."

Haskell & Barker Car Company, Inc.

E. F. Carry, president of the Haskell & Barker Car Company, Inc., in his first annual report to the stockholders, said in part:

"Your company took over the plant of the former Haskell & Barker Car Company, January 21, 1916, and after completing for the old company work under construction, commenced operations for the new company's own account about February 1, 1916. Net earnings for the first fiscal year, after payment of all operating charges, were $829,617.70. Out of this earning a dividend of 75 cents per share has been paid, totaling $165,000. There has also been set up a reserve of $135.000 for extraordinary renewals and replacements. After deduction of the above mentioned appropriations there remained a balance for surplus of $529,617.70.

"The general balance sheet which forms part of this report

shows that your company is in excellent financial condition. The net assets are approximately equally divided between those in fixed and current form. The working funds are adequate for the conduct of the business. Your company is in position to take advantage of all discounts offered and to buy materials advantageously for cash. There is no interest-bearing indebtedness, and your company owes only its current accounts for material and labor. The receivables consist almost entirely of short-term accounts with railroads for cars, and are, therefore, practically cash. While the inventory is large, the greater portion of it will be consumed in the completion of contracts now on the books. The entire inventory has been priced at cost or less, and all prices are well below the present market.

"Orders on the books will keep your plant fully occupied for at least six months. It would be unwise, under the present unsettled and unusual conditions, to attempt to predict the trend of business during the last half of 1917 and the first half of 1918."

Assets		Liabilities	
Cash	$680,885	Current liabilities	$1,189,794
Accounts receivable	2,054,176	Reserve for operating accounts	29,571
Securities owned	45,578	Reserve for extraordinary renewals and replacements	135,000
Inventories of materials, work in progress, etc.	3,368,299	Capital stock	9,332,000
Property and plant	5,067,045	Surplus	529,618
	$11,215,983		$11,215,983

TRADE PUBLICATIONS

BALL BEARING INDUCTION MOTORS form the subject of bulletin 211-A issued by Fairbanks, Morse & Co., Chicago. The bulletin gives a short description of the bearing, the rotor with solid metal winding, and a vertical shaft motor. A table of standard horsepowers and speeds is also included.

FORGINGS.—Bulletin 87, recently issued by the Union Switch & Signal Company, deals with the company's forge plant. The company is able to handle expeditiously any type of forging made from open hearth, crucible, nickel, chrome vanadium, bronze and other alloy steels. The fire on February 10 did not reach the forge plant.

BALL BEARINGS IN MACHINE TOOLS.—This is the title of a very attractive booklet recently issued by the Hess-Bright Manufacturing Company, Philadelphia. The booklet describes the annular type of ball bearing, and shows its advantages over earlier types. There are several illustrations of the bearing and machines on which they are used.

CRANES.—The Whiting Foundry Equipment Company, Harvey, Ill., has recently issued Catalogue 127, descriptive of the company's line of cranes of all types for every service. The booklet contains material relative to electric traveling cranes, locomotive and coach hoists, gantry traveling cranes, etc. Views are given of the cranes and their details, and one-half of the 48 pages are devoted to views of the Whiting cranes at work.

THOR TOOLS.—The Independent Pneumatic Tool Company, Chicago, has issued catalogue No. 10, containing 94 pages descriptive of its pneumatic and electric tools used for drilling, reaming, tapping, flue rolling, riveting, shipping and other work of a similar character. In addition to illustrations of the tools described, the catalogue contains tables of properties, dimensions and weights and other information of interest in connection with the tools.

REDUCING VIBRATION AND NOISE.—This is the title of a booklet recently issued by the Armstrong Cork & Insulation Company, Pittsburgh, Pa., to explain and show the excellencies of Nonpareil cork machinery insulation. This insulation is used for reducing the noise and vibration of fans, motors, printing presses and machinery generally. The booklet emphasizes the necessity for eliminating this noise and vibration in so far as possible, and shows with illustrations how Nonpareil insulation secures the desired results.

CHINESE RAILWAYS PRODUCTIVE.—China's government railways report great progress for the past year. The Peking-Hankow Railway shows an increase of receipts over last year's of $2,300,000; the Peking-Mukden Railway, $1,160,000; the Tientsin-Pukow Railway, $1,200,000, and the Peking-Suiyuan Railway, $200,000.

Railway Construction

CHICAGO, BURLINGTON & QUINCY.—This company has postponed for 30 days the award of contracts for the construction of a proposed line from Monroe, Mo., to a point 3½ miles west of Moberly, a distance of 46 miles.

EXPORT RAILWAY.—Construction work is to be started at once on a 15-mile line in Hillsboro county, Fla; also on a six-mile spur line. Contract is let to E. W. Parker, Tampa, Fla., to build this line. H. L. Pierce, president, and L. W. Cottman, chief engineer, Tampa, Fla.

GEORGIA ROADS.—Work is to be started at once, it is said, on a line from Brookton, Ga., on the Gainesville & Northwestern northwest to pyrites mines in Lumpkin county about 12 miles. The line may be extended later to Dahlonega. On completion the line may be operated by the Gainsville & Northwestern. N. P. Pratt and G. L. Pratt, Atlanta, are said to be interested.

KOSCIUSKO & SOUTHWESTERN.—This company expects to have all the track laid in about 30 days on a line building from a junction with the Illinois Central at Kosciusko, Miss., to a point known as Zama, 16 miles southeast of Kosciusko. The work involved handling about 10,000 cu. yd. to the mile. The line will have a maximum grade of 1.5 per cent, and a maximum curvature of 4 deg. It is being built to carry lumber, other forest products and agricultural products. A. L. Franklin, president, Kosciusko, Miss.

LAKE SHORE RAILROAD.—See Utah Roads.

LOUISIANA & PINE BLUFF.—This company is making preliminary surveys for an extension from Dollar Junction, Ark., northwesterly about 33 miles to Calion, Ark., on the Chicago, Rock Island & Pacific. Contracts for the grading and bridging will probably be let about July 1.

PENNSYLVANIA LINES WEST.—This company plans to widen the tunnel from Seventh avenue to Forbes street, Pittsburgh, Pa.

PENNSYLVANIA RAILROAD.—This road has bought land at Thirty-sixth street and River road, Pensauken township, Camden, N. J., for the purpose of building a spur to the Delaware river front to connect with a proposed bridge to Petty's Island.

RED RIVER & GULF.—Contracts have been let to Irvin McGinnis, Alexandria, La., and J. Moore & Son for grading work on an extension from Long Leaf, La., northwesterly, through Rapides and Vernon parishes, to Hornbeck on the Kansas City Southern, about 65 miles. All the other work on the line is to be carried out by companies' forces. The maximum grade will be 1 per cent, and maximum curvature 3 deg. The grading involves handling about 17,000 yd. to the mile. The company expects to develop a traffic in lumber, logs, farm products and merchandise.

SOUTHERN RAILWAY.—The contracts recently let by the Southern Railway for 26.3 miles of double tracking work on the Alabama Great Southern were given to the following contractors: M. M. Elkan, Macon, Ga., for the section from Tannehill, Ala., to Vance; and to Robert Russell, Charlotte, N. C., for the lines from Burstall, Ala., to Tannehill, and from Toomsuba, Miss., to Russell. (March 30, p. 725.)

SPRINGFIELD & CARBONDALE.—This company has filed application with the State Public Utilities Commission of Illinois for a certificate of convenience and necessity permitting it to construct a line from Springfield, Ill., through Sangamon, Montgomery, Bond, Clinton, Perry and Jackson counties to Carbondale, about 140 miles.

TAMPICO & PANUCO VALLEY.—A despatch from Tampico, Mexico, reports that the Royal Dutch Petroleum Company, which recently purchased this road, will extend the line from Panuco up the valley of the Panuco river, a distance of about 200 miles, as soon as the political and financial conditions of Mexico become more settled. This company also plans to carry on extensive oil development and prospecting operations at points along the route of the proposed extension. It will use

the line primarily for its own freight, but the territory is one of the richest agricultural regions of Mexico.

TEXAS AIRLINE INTERURBAN.—Incorporated in Texas, with $250,000 capital and principal office at Waco, Tex., to build five connecting interurban lines in Texas. The stockholders include J. D. Hunt, Caldwell, Tex.; H. H. Hunt and William Tait, Columbus; and B. B. Hunt, Waco.

UTAH ROADS.—The Utah-Idaho Sugar Company, Salt Lake City, Utah, will commence the construction of several steam lines about April 15, to be operated in connection with the beet sugar business. The first to be known as the Lake Shore Railroad will form a loop, beginning at Spanish Fork, Utah, and passing through Palmira, Lake Shore and Benjamin. Preliminary surveys for this line have already been made. Some grading has been done and rails are now being delivered. Another 10-mile line also will be constructed from Bear river, Utah, to Garland. The cost of the lines is estimated at $300,000, and it is expected to have them in operation by September 1, 1917.

RAILWAY STRUCTURES

BATON ROUGE, LA.—The Yazoo & Mississippi Valley will soon build an extension to its passenger station, and will construct, in addition, mechanical facilities consisting of a coal chute, an eight-stall roundhouse, a storehouse and several other small buildings. The cost of these improvements will be $35,000. The work will be done by company forces.

BONNER'S FERRY, IDAHO.—The Spokane & Inland Empire has awarded a contract to Porter Bros., Spokane, Wash., for the reconstruction of a bridge at this point at an estimated cost of $35,000.

BUFFALO, N. Y.—A contract has been given by the Pennsylvania Railroad to the Joseph F. Stabell Company, Buffalo, to build a viaduct on the line of the Hamburg Turnpike between Tifft street and the Rodgers-Brown Canal, at Buffalo.

FREDERICK, MD.—Bids have been received by the Pennsylvania Railroad for a two-story brick passenger station, to be built at East street, Frederick, to cost about $14,000. The building is to be 21 ft. 6 in. wide and 85 ft. 3 in. long. The work will probably be started about May 1.

GRAND ISLAND, NEB.—The Chicago, Burlington & Quincy has started the construction of a reinforced concrete bridge over the Platte river between this point and Phillips, Neb. It will consist of four 20-ft. and twenty-six 25-ft. concrete slab spans and six 60-ft. steel deck plate girder spans. Company forces will do this work. The estimated cost is about $100,000.

HELENA, ARK.—The Yazoo & Mississippi Valley, jointly with the Missouri & North Arkansas, has awarded a contract to the Leyden-Ortseifen Company, Chicago, Ill., for the construction of separate passenger and freight stations at this point. The structures will be of concrete, brick and stone, with tile roofs. The passenger depot will be 41 ft. by 96 ft. and two stories high, while the freight extension will be 41 ft. by 282 ft., and one story high. Actual work will commence on or about May 1. The cost is estimated at $60,000. (March 9, p. 426.)

HOUSTON, TEX.—The Houston, Richmond & Western intends shortly to erect a new passenger station. The building will be of brick and concrete construction, and will cost about $100,000.

ST. PETERSBURG, FLA.—The Atlantic Coast Line has bought land at St. Petersburg for the future development of a yard. The company does not contemplate any immediate work at St. Petersburg.

SELMA, N. C.—New freight yard and engine terminals at Selma have been authorized by the Southern Railway System, and construction work will begin as soon as contracts can be let and material assembled. The new facilities will include: Six yard tracks, each of 100 cars capacity; 300-ton steel mechanical coal handling plant, serving one engine track and the main line; two cinder conveyors; engine storage, standing and approach tracks; repair tracks for 34 cars, with paint, carpenter and blacksmith shops; water and compressed air facilities; pens for watering and feeding stock in transit; new track scale; moving freight house and relocation of main line; connecting and industrial tracks to accommodate situation of new yard.

Railway Financial News

AUGUSTA SOUTHERN.—See Georgia & Florida.

BOSTON & MAINE.—Minority stockholders have prepared a plan of reorganization, which will provide for the issue of new preferred and common stock in exchange for outstanding preferred and common stock, and new preferred stock in exchange for outstanding stock of the leased lines.

CANADIAN PACIFIC.—It is understood that negotiations are going on between a group of New York bankers and representatives of the Canadian Pacific, discussing a plan under which the Canadian Pacific would issue collateral trust bonds and sell them in the New York market, and would purchase its own securities, presumably held abroad, and deposit them under the mortgage securing these new bonds.

GEORGIA & FLORIDA.—On April 1 this company took over the Augusta Southern. The Georgia & Florida runs from Augusta, Ga., to Madison, 250 miles, and the Augusta Southern runs from Augusta, Ga., to Tennille, 83 miles.

PENNSYLVANIA RAILROAD.—This company has sold to a syndicate of bankers $60,000,000 general mortgage 4½ per cent bonds of 1916-1965. The bonds are being offered to the public at 97½, yielding 4⅝ per cent interest on the investment. These bonds are legal investments for savings banks in New York and all New England states, and are free of Pennsylvania state tax. The general mortgage securing these bonds is a first mortgage on 402 miles of road, and a general mortgage subject to $159,147,390 prior lien bonds on 2,366 miles, which includes almost the entire railroad owned by the Pennsylvania.

PERE MARQUETTE.—The Williamsburg division of the Chicago & Northern Michigan, a branch of the Pere Marquette, has been sold at auction for $525,000 to W. P. Phelps and Walter W. Cox.

PITTSBURGH & WEST VIRGINIA.—Stockholders of this company, which is the successor to the Wabash-Pittsburgh Terminal, have elected the following directors: W. H. Coverdale, chairman; Haley Fiske, W. R. Nicholson, J. B. Dennis, Richard Sutro, Eugene V. R. Thayer, E. R. Tinker, James C. Chalin, A. M. Hall, Jr.; A. S. Wing, Arnold Scheuer and H. E. Farrell.

WABASH-PITTSBURGH TERMINAL.—See Pittsburgh & West Virginia.

RAILWAY LOAN IN PRUSSIA.—According to press despatches, the Budget Committee of the Prussian Diet has approved a plan for a railroad loan of 312,000,000 marks ($74,880,000). Of this amount 260,000,000 marks ($62,400,000) will be used for the purchase of rolling stock.

BRITISH RAILWAY CLOSED AS A WAR MEASURE.—The Solway Junction Railway, which is part of the Caledonian system connecting Kirtlebridge with Abbey Junction, on the Silloth branch, and Brayton on the Maryport and Carlisle Railway, was temporarily closed on February 1 as a war measure.—*The Engineer, London.*

THE POST OFFICE RAILWAY.—Up to March 31, 1916, a total of £355,497 ($1,727,715) had been spent on the underground railway which is being constructed in London for the conveyance of mails. At that date the unexpended balance of the authorized expenditure on the undertaking was £744,503 ($3,618,285).—*Railway Gazette, London.*

WAR TRAFFIC IN ENGLAND.—During the past year the Midland & South-Western Junction Railway has carried 12,007 officers, 331,540 men, 25,131 horses, 1,891 vehicles loaded with guns, 1,687 tons of baggage, and 366 ambulance trains. Since August, 1914, it has conveyed 30,477 officers, 961,835 men, 104,622 horses, 7,880 vehicles loaded with guns, 3,392 cycles and motor cycles, 6,566 tons of baggage, 3,924 special troop trains, and 674 ambulance trains.—*The Engineer, London.*